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Air Pollutant Source Attribution for Southeast Texas using 14 C/ 12 C ratios

by

Kenneth Robert Lemire, B.S.

Thesis

Presented to the Faculty of the Graduate School
of the University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of
Master of Science in Engineering

The University of Texas at Austin

May 2001

Air Pollutant Source Attribution for Southeast Texas using ¹⁴C/¹²C ratios

APPROVED BY

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Air Pollutant Source Attribution for Southeast Texas using ¹⁴C/¹²C ratios

by

Kenneth Robert Lemire, M.S.E.

The University of Texas at Austin, 2001

SUPERVISOR: David T. Allen

Both ambient air samples for VOC analysis and particulate matter samples were collected in the greater Houston area in an attempt to assess the biogenic contribution to the formation of ground-level ozone and particulate matter through the use of radiocarbon measurements. This effort was just a small portion of the many experiments conducted as a part of the Texas Air Quality Study (TEXAQS) 2000. In particular, this set of samples was collected in the time frame of early August 2000 to mid September 2000, when the TEXAQS program was at its most intensive point, with the intention of utilizing the many other sources of supporting and collaborative data that were created in that time period.

Biogenic emissions play a substantial role as a source of particulate matter for two sampling sites in particular. The results from eleven samples, taken from a suburban site (Aldine) in northwest Houston and a rural site (Conroe) approximately thirty miles north of Houston, provide strong evidence of a significant fraction of the particulate matter collected being biogenic in

origin. Values reported from Aldine fall into two distinct ranges of 25-37% biogenic or 46-68% biogenic. One sample from Conroe, dated 13 August 2000, has a biogenic fraction of 72%.

All eleven samples were taken prior to a forest fire event that occurred during the TEXAQS period. Very little evidence was found for vegetative detritus as a source of organic carbon in any of the samples for which trace metal data are available. Little evidence of cooking emissions is seen in the trace metal analyses for two samples at Aldine (18 and 19 August), and only small contributions from cooking are expected for a 25 August sample.

Therefore, with the exception of accounting for the possibility of small amounts of young carbon (¹⁴C) produced by cooking activity, the remainder of the particulate matter must be attributed to secondary organic aerosol at Aldine and Conroe on these dates, and a significant portion of that SOA must be biogenic in origin. VOC data do not indicate the presence of significant levels of isoprene at Aldine, suggesting conifer trees provide substantial biogenic emissions. In the case of Conroe, there were several occasions during the TEXAQS period when large isoprene concentrations were detected by aircraft, in isolated regions, north of Houston in the vicinity of the sampling site. Therefore, isoprene emissions and other emissions from deciduous vegetation may be a source of biogenic SOA in isolated areas north of Houston.

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I INTRODUCTION

I.1 GENERAL

Two primary areas of concern with regard to poor air quality are the formation of ozone within the lower troposphere and the production of fine particulate matter (PM). Both pollutants are well documented as hazardous to human health, and widely regarded as extremely difficult to control. Many sources, both natural and man-made, contribute to the eventual appearance of ozone and PM. Complicated, and hard to predict, meteorology adds to the complexity. With the ultimate goal of adopting control strategies that will significantly reduce the amount of ozone and PM emitted to the atmosphere, tools such as regional photochemical (grid-based) modeling and trajectory, or plume-based, modeling are used to theorize the origin and transport of various pollutants. However, the models are limited by the current understanding of atmospheric science, especially the potential significance of biogenic (or natural) emissions compared to anthropogenic (or man-made) emissions.

I.2 OZONE

Ozone (O₃) is a highly reactive gas that is naturally formed at high altitude in the stratosphere by photochemical reactions involving molecular and atomic oxygen in the presence of high-intensity ultraviolet radiation. Its concentration in the upper atmosphere depends on both the altitude and latitude. Ozone there plays a beneficial role by absorbing ultraviolet radiation from the sun and thus protecting the life on earth from the destructive effects of such radiation. Unlike the "good" stratospheric ozone, there is also the "bad" ozone in the troposphere near the ground, which is damaging to plants and materials

and harmful to human health. Ozone is formed in polluted atmospheres as a result of a rather wide variety of photochemical reactions involving nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight.

The chemistry of tropospheric ozone formation is complex. The production of ozone from the photodissociation of NO₂ is illustrated by the following chemical reactions:

$$NO_2 + h\nu \rightarrow NO + O(^3P)$$

 $O(^3P) + O_2 \rightarrow O_3$
 $O_3 + NO \rightarrow NO_2 + O_2$

where hv represents the ultraviolet radiation.

Nitrogen dioxide (NO₂) is photodissociated into nitric oxide (NO) and an excited state of oxygen O(³P). The excited oxygen reacts with a diatomic oxygen molecule, producing ozone, O₃. However, this ozone reacts with NO, forming NO₂ and O₂ and closing the cycle. This simple cycle of reactions, resulting in formation but no net accumulation of ozone, establishes a photostationary state.

In the presence of VOCs, however, the above photostationary equilibrium is disturbed, because NO is converted into NO₂ by chemical reactions involving reactive hydrocarbons without consuming O₃. Reactions of VOCs and oxygen with OH radicals, which normally exist in the ambient atmosphere, yield RO₂ radicals, which then compete with ozone for the oxidation of NO and NO₂. There are hundreds of photochemical chain reactions involving the wide variety of reactive hydrocarbons that exist in a polluted atmosphere. The net result is the accumulation of ozone (Arya, 1999).

Figure I-1 Photostationary equilibrium

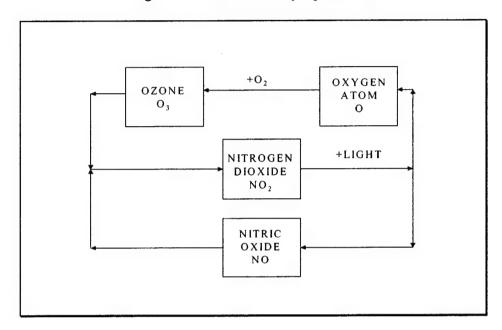
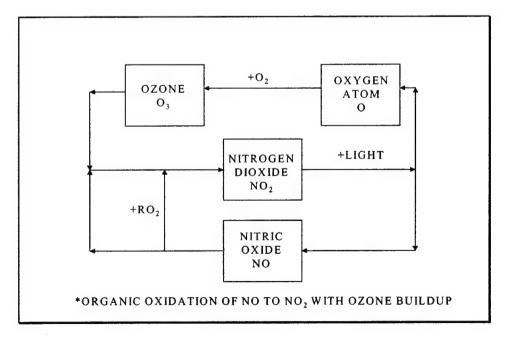


Figure I-2 Accumulation of ozone



Ozone is used as an indicator pollutant for photochemical oxidation products. The total mixture, frequently referred to as smog, causes eye irritation, lachrymation, and respiratory difficulties for people walking or working outdoors. Ozone has an acrid, biting odor that is a distinctive characteristic of photochemical smog. High concentrations of ozone and other photochemical oxidants are observed over most large cities and metropolitan areas during summer months. Harmful levels of ozone are also found to exist over large rural regions to which ozone gets transported from large urban and industrial areas. Thus, the tropospheric ozone is not merely an urban air pollution problem but also a regional problem, particularly for North America and Europe. It is by far the most persistent problem that has defied simple solutions based on current emissions control strategies (Arya, 1999).

I.3 PARTICULATE MATTER

Atmospheric particulates or aerosols include all liquid and solid particulates, except pure water, that exist in the atmosphere under normal conditions. Many of these are a result of direct emissions of particles from various natural and anthropogenic sources, while others form from the condensation of certain gases and vapors that are emitted into the atmosphere or are a result of chemical transformations. A full description of atmospheric aerosol requires specification of concentration, size distribution, chemical composition, phase (liquid or solid), morphology, and biological activity.

Sizes of atmospheric particles are expressed in several different ways. The most common measure is the actual diameter in micrometers (µm) for spherical particles. Nonspherical particles are frequently characterized in terms of the diameter of equivalent spherical particles that would have the same

volume, same mass, or same aerodynamic properties as the actual particles. On the basis of size, atmospheric particles are usually divided between two broad categories, fine particles and coarse particles. In view of the National Ambient Air Quality Standards (NAAQS) for particulate matter less than 10 μ m in size (PM₁₀), 10 μ m might be considered a reasonable choice for the boundary between coarse and fine particles. In practice, fine and coarse fractions are considered to be those collected by the fine and coarse fractions of a dichotomous particulate sampler, the fine stage having an upper cutoff point of about 2.5 μ m (collecting particles smaller than 2.5 μ m in aerodynamic diameter or PM_{2.5}) (Urone, 1986). Although the total suspended particulate matter (TSP) is relevant for visibility, soiling, and corrosion effects of particles, PM₁₀ and PM_{2.5} are considered more important for health effects. Also, particles larger than 10 μ m fall out more readily through gravitational settling (Arya, 1999).

Based on their emission sources and mechanisms of formation, aerosols can be classified as primary and secondary aerosols. Primary aerosols are emitted in particulate form directly from sources and contain particles of all sizes. Secondary aerosols are particles produced in the atmosphere from gasphase chemical reactions that generate condensable species. These are mainly sub-micron-sized fine particles (Seinfeld, 1986).

Major natural sources of atmospheric particulates are soil and rock debris, sea spray, wild fires, volcanic eruptions, and reactions between natural gaseous emissions. Anthropogenic sources of particulate matter can be divided into four broad categories: (1) fuel combustion and industrial processes, (2) industrial process particulate emissions, (3) nonindustrial emissions, and (4) transportation sources (Seinfeld, 1986). According to estimates by the U.S. Environmental Protection Agency (1982), nonindustrial emissions (roadway)

dust from paved and unpaved roads, wind erosion from croplands, agricultural activities, etc.) of PM₁₀ in the United States, on a mass basis, far exceed the particulate emissions from industrial and transportation sources. However, the impact of the dominant sources of nonindustrial emissions is limited to rural areas, because the emissions are mostly large particles that settle to the ground a short distance from the source. In urban areas, local emissions from industrial and transportation sources are more important, and in rural areas, local and regional industrial sources are significant contributors to the fine particulate matter fraction. The major source of nonindustrial, nontransportation particulate matter in urban areas is believed to be cooking activities (Arya, 1999).

Most of the particulates from transportation sources come from vehicle exhausts. These are generally smaller than 1 µm in diameter and are composed primarily of carbonaceous matter with some inorganics and metals. Primary particulate matter from other fuel combustion sources also fall into the category of fine particles, but may contain a large variety of chemical compounds, depending upon the type of fuel used and the type of combustion process involved (Arya, 1999).

I.4 BIOGENIC EMISSIONS

Vegetation is the most important natural source of atmospheric hydrocarbons. A compilation of organic compounds in the atmosphere lists a total of 367 different compounds that are released to the atmosphere from vegetative sources (Graedel, 1978). Averaged by land use over the continental United States, the natural emissions of reactive VOC (mainly isoprene and monoterpenes) are estimated to be approximately 1.4 times greater in total amount than anthropogenic sources of VOC. On a region-by-region basis,

however, this ratio likely varies considerably (Guenther, 2000). In Houston approximately 50% of all VOCs are of biogenic origin, and for the entire region of eastern Texas, that value may be as high as 80-90%. Other natural sources include microorganisms, forest fires, animal wastes, and volcanoes. One of the simplest organic compounds given off by plants is ethylene, C₂H₄. This compound is produced by a variety of plants and released to the atmosphere. Because of its double bond, ethylene is highly reactive with hydroxyl radical, HO·, and with oxidizing species in the atmosphere. Ethylene from vegetation sources should be considered as an active participant in atmospheric chemical processes.

Most of the hydrocarbons emitted by plants are either terpenes or isoprene (a five-carbon hemi-terpene), which constitute a large class of organic compounds found in essential oils. Most of the plants that produce terpenes belong to the family *Coniferae*, the family *Myrtaceace*, and the genus *Citrus*. One of the most common terpenes emitted by trees is α -pinene, a principle component of turpentine. The terpene limonene, found in citrus fruit and pine needles, is encountered in the atmosphere around these sources. Isoprene (2-methyl-1,3-butadiene), a hemiterpene, has been identified in the emissions from cottonwood, eucalyptus, oak, sweetgum, and white spruce trees. Other terpenes known to given off by trees include β -pinene, myrcene, ocimene, and α -terpinene.

As exemplified by the structures of α -pinene (A), isoprene (B), and limonene (C), shown in Figure I-3,

Figure I-3 Molecular structure of some example biogenic emissions

terpenes contain alkenyl (olefinic) bonds, usually two or more per molecule. Because of these and other structural features, terpenes are among the most reactive compounds in the atmosphere. The reaction of terpenes with hydroxyl radical is very rapid, and terprenes also react with other oxidizing agents in the atmosphere, particularly ozone. Turpentine, a common mixture of terpenes, has been widely used in paint because it reacts with atmospheric oxygen to form a peroxide, then a hard resin. It is likely that compounds such as α -pinene and isoprene undergo similar reactions in the atmosphere to form particulate matter (Manahan, 1991).

I.5 RADIOCARBON (14C) MEASUREMENTS

The connection between biogenic emissions (a major source of highly reactive VOCs) and the formation of ground-level ozone and particulate matter is well established. Isoprene, for example, can act as a sink for NO, can contribute to sequestration of nitrogen (allowing long distance transport), and through oxidation products (ketones, aldehydes, carbon monoxide) can have an impact on ozone chemistry (Fehsenfeld, 1992). Secondary aerosols are created from the reaction of α-pinene with ozone. These products include diacids, dominant during summer conditions, and di-carbonyl and carbonyl-acids, more frequent during winter conditions (Kamens, 1999). However, a large amount of uncertainty remains concerning how little or much these particular emissions contribute to the overall control problem (models have been used, but significant uncertainties exist in the models). There is also substantial difficulty inherent in direct measurement of the emissions because they are very reactive, and the reaction products are hard to isolate.

Therefore, the first step toward evaluating the degree of influence this set of VOCs has within the atmospheric chemistry is to obtain accurate measurements of radiocarbon (14 C). 14 C is absent in fossil fuels due to decay with a half-life of 5730 years, yet present in living materials at measurable levels, 14 C/ 12 C $\approx 1.2 \times 10^{-12}$ (Klouda, 1999). Once an air sample containing ozone or a filter sample with deposited particulate matter is collected, a process that determines the quantity of 14 C within the sample may provide essential information about the role that biogenic VOCs play as precursors to pollutants. When it is determined that a significant portion of an individual air sample consists of 14 C containing species, an extensive speciation that details exactly

what compounds are present can also be invaluable. Since most types of vegetation have a fairly unique emissions signature, with the use of meteorological data, a particular VOC might be backtracked to its source.

I.6 PREVIOUS ¹⁴C MEASUREMENTS

In recent years, the National Institute of Standards and Technology (NIST) and the United States Environmental Protection Agency (EPA) have explored methods and analytical procedures to collect enough carbon from atmospheric non-methane VOC fractions to measure the ¹⁴C composition. Some particular areas of study have included Azusa, CA, Houston, TX, and Nashville, TN. In all of this previous work, air samples were collected during the summer. In Azusa (1997) air was compressed into canisters on several days during the following periods: 1) 0600-0900 hours, 2) 1300-1600 hours, and 3) 1700-2000 hours. Three air samples were cryo-collected in Nashville (1995), nominally from 0730-1130 hours at a site 24 kilometers southeast of the city center in a rural area, and combined into two samples. A third composite sample was comprised of 12 32-liter compressed air samples collected atop the city center Polk Building representative of 1200 to 1800 hours. In Houston (1994) samples were collected at three sites: 1) a northern suburban/rural site (Aldine) (AM and PM), 2) an industrial site (Clinton) in the ship channel area (PM), and 3) the Sam Houston National Forest 80 kilometers north of Houston (PM) (Klouda, 1999).

In Azusa fossil VOC-C was dominant in the early morning while biogenic emissions increased significantly in the afternoon, consistent with high pollution events driven more by fossil fuel than by non-fossil related emissions. In Nashville the city center showed a higher biogenic fraction $(37\% \pm 6\%)$ than

at the rural site, counter to what one might expect. However, there was a possibility of an intrusion of clean background air or some other source of living carbon. The ship-channel site in Houston was entirely void of 14 C in contrast to the National Forest sample that shows a surprisingly low but significant biogenic fraction, $23\% \pm 8\%$. The largest percentage of biogenic VOCs observed, $55\% \pm 4\%$, were from the Houston suburban/rural site in the afternoon (Klouda, 1999).

For the regions studied, the results suggested that biogenic sources are not the major contributor to atmospheric VOCs. However, no conclusions were drawn as to whether or not even a small fraction of biogenic emissions, being extremely reactive, are significant to the atmospheric chemistry involved with the formation of ground-level ozone or particulate matter. Also, obtaining an accurate measurement of the ¹⁴C contained within a given air sample can be extremely difficult due to the necessity of removing all atmospheric CO₂. The samples also have to endure many steps, creating opportunities for human error and uncertainty, within the process that eventually produces graphite for ¹⁴C accelerator mass spectrometry measurement.

I.7 HOUSTON

The city of Houston, and its surrounding area, is a unique region to study for the formation and transport of pollutants. The location of Houston on the Gulf of Mexico subjects the metropolitan area to some unusual meteorology including drastically shifting wind patterns throughout the course of a single day. There are also a wide variety of sources in and around the city that are subjected to this almost daily land-sea breeze. Not only is there the highly industrialized complex known collectively as the Ship Channel directly off of

Galveston Bay, but there is also a significant amount of urban traffic and a fairly substantial biogenic source from forestland immediately to the north of the city.

Houston air quality has been investigated for quite some time. As previously mentioned in the Klouda ¹⁴C-VOC experiments, even the biogenic contribution has been examined to some degree. However, newer, more accurate methods of sampling have since been developed that may or may not create a different perspective. Also, previous sampling involved only a few samples and did not include particulates.

I.8 RESEARCH GOALS

The primary goals of this work were:

- 1) to collect particulate and VOC samples suitable for ¹⁴C analysis during the 2000 Texas Air Quality Study (TEXAQS),
- to assemble sufficient data, collected by other investigators during TEXAQS, to predict the amount of ¹⁴C present within the canister (VOC) and filter (PM) samples,
- 3) to compare predicted ¹⁴C levels to actual results from a portion of the samples selected for ¹⁴C measurement.

II METHODOLOGY

II.1 GENERAL

A set of samples was collected in the greater Houston area in an attempt to assess the biogenic contribution to the formation of ground-level ozone and particulate matter through the use of radiocarbon measurements. This effort was just a small portion of the many experiments conducted as a part of the Texas Air Quality Study (TEXAQS) 2000. In particular, this set of samples was collected in the time frame of early August 2000 to mid September 2000, when the TEXAQS program was at its most intensive point, with the intention of utilizing the many other sources of supporting and collaborative data that were created in that time period.

II.2 SITES

II.2.1 General

All the sites that were chosen for sampling were selected on the basis of unique ¹⁴C signatures that were expected. The following basic signatures were desired: 1) clean background air off of the Gulf of Mexico, 2) heavy industrial, preferably in the vicinity of the Ship Channel, 3) urban traffic, 4) downwind of the urban core, including the Ship Channel, and perhaps most importantly, 5) heavy biogenic, more than likely to the north of the city. Balancing what is expected to be present in an air sample of the various sites with what is actually observed through sampling is essential to the eventual understanding and modeling of what is occurring within the atmosphere.

II.2.2 Galveston

FM617 SI San Leon East Bay Galveston 8 a y Dickinson ickinson Bayba 010 Bolivar Beach Palmer Hwy 0100 FM-1764 Port Bolivar Alta Loma Santa Fe Fort Travis Texas City Terminal Junction Hitchcock Virginia Point Galveston West Bay Fort Crockett Gulf Mexico @ 1999 Microsoft Corp. All rights reserved.

Illustration II-1 Galveston regional map

Illustration II-2 Galveston street map

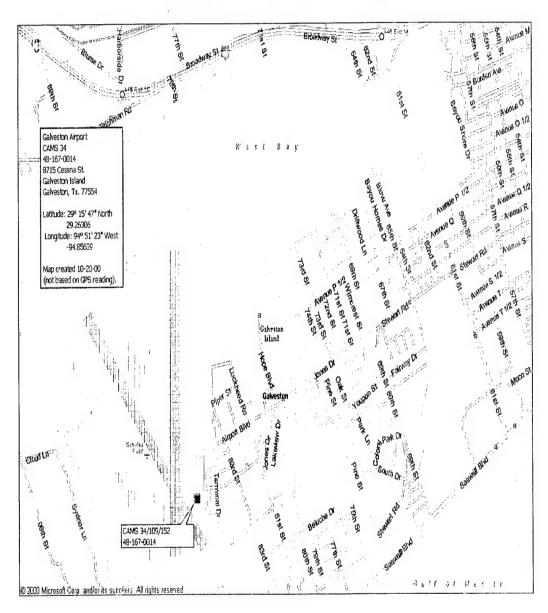
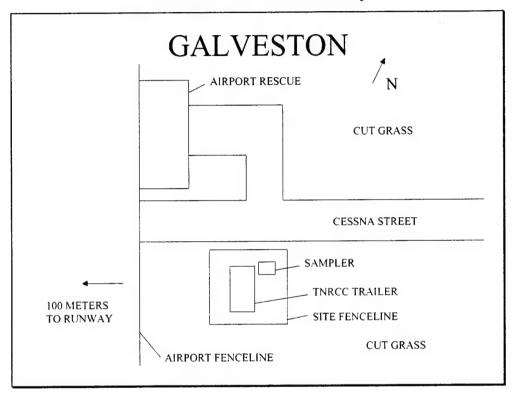


Illustration II-3 Galveston site map



The Galveston site was chosen for the possibility of sampling relatively "clean" air originating from the Gulf of Mexico. When the wind is blowing inland, this air can serve as a background fingerprint for what is present in the atmosphere prior to an air parcel passing over the Ship Channel and/or downtown Houston. When the wind shifts direction, which is not that uncommon, and blows out to sea, this site can be used as a downwind monitoring station for an air parcel that has passed over many of the urban sources. The site is located in an area with almost no vegetation (with the exception of grass), and the nearby airport has very little air traffic. Due to the lack of an elevated platform, sampling was conducted at the ground level.

II.2.3 HRM-3 (C603)

Sheldon 0603 Tidwell Rp 015 Mont Belviel leaumont (1 lace) 0148 0607 **B**don ⇒Wooster 0167 0166 0811 0169 Deer Pa Bolgen Acres Beach City Lomax

Illustration II-4 HRM-3 regional map

Illustration II-5 HRM-3 street map

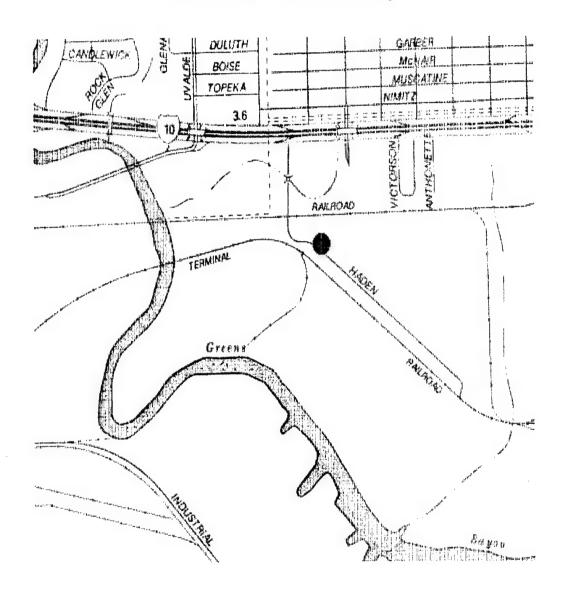
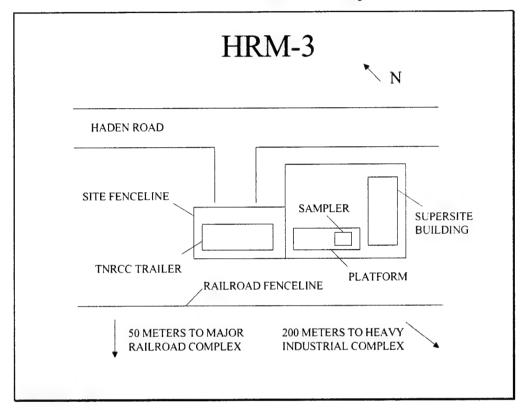


Illustration II-6 HRM-3 site map



A site within the immediate vicinity of the Houston Ship Channel was absolutely essential for gathering information about what is arguably the biggest area source of industrial emissions within the region. HRM-3 is just one of numerous monitoring stations that gathers data for this purpose. However, this particular site is also downwind (most of the time) of almost the entire heavy industrial complex. There are a very limited number of tall trees across the street to the northeast that may provide some local biogenic emissions. The railroad complex within the immediate vicinity has a significant amount of train activity. A temporary platform was constructed within the site fenceline for sampling at approximately ten feet above ground level.

II.2.4 Washburn Tunnel

Illustration II-7 Washburn Tunnel regional map

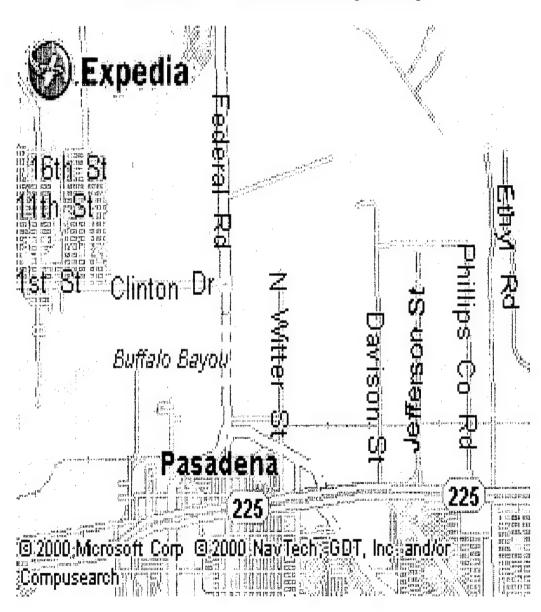


Illustration II-8 Washburn Tunnel street map

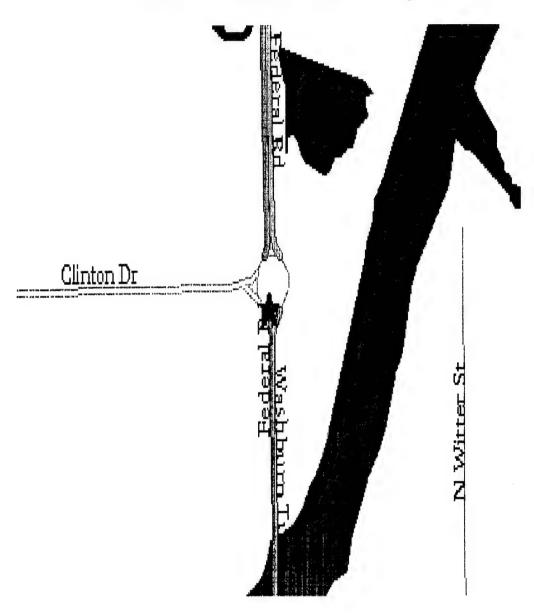
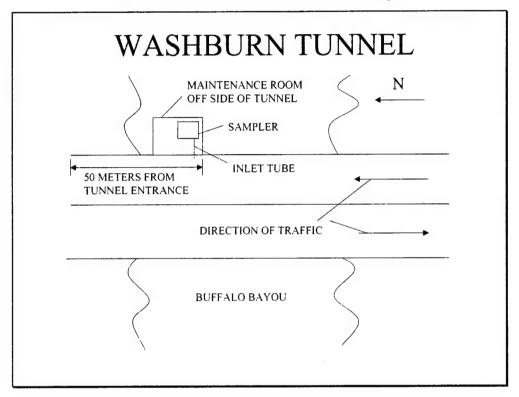


Illustration II-9 Washburn Tunnel site map



Within a major metropolitan area such as Houston, the daily contribution made to atmospheric chemistry by vehicular emissions is quite significant. An opportunity to sample at a site that would exhibit almost exclusively vehicular emissions became available about midway through the TEXAQS program. The 800 meter long Washburn Tunnel was sampled during rush hour traffic in an attempt to capture emission source data that are usually difficult to separate from other urban sources. The sampler in this particular case was placed on the floor of a maintenance room that had direct access to the inside of the tunnel. A teflon tube was used to collect air from the tunnel and deliver it to the inlet port on the sampler. Video cameras within the tunnel provide vehicular information.

II.2.5 Aldine (C08)

Illustration II-10 Aldine regional map

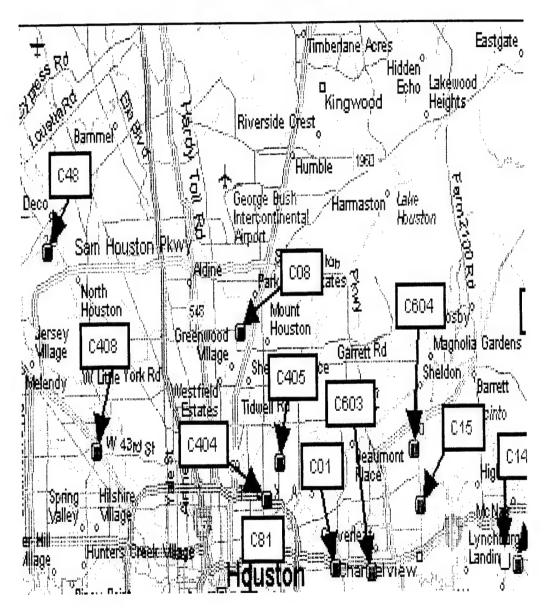


Illustration II-11 Aldine street map

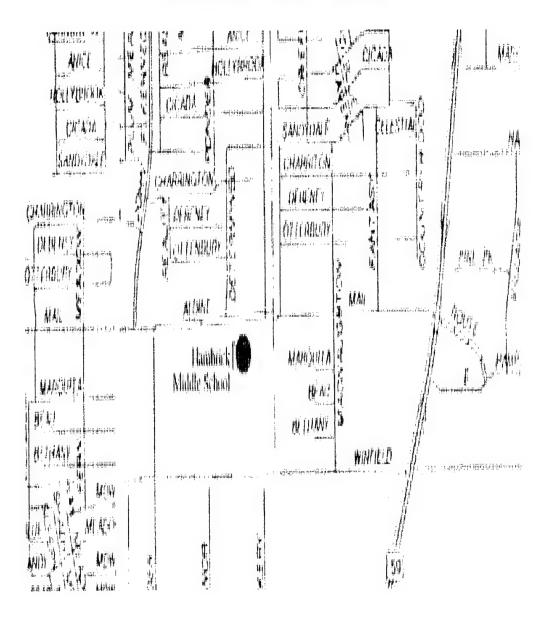
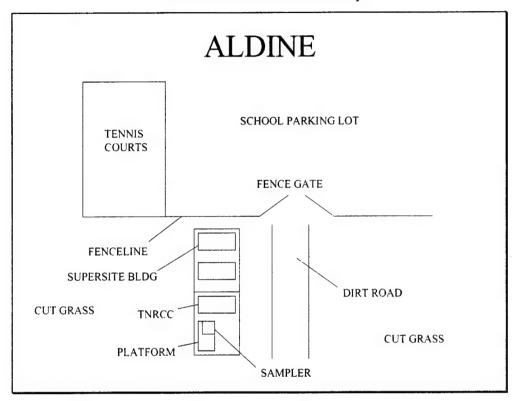


Illustration II-12 Aldine site map



The sampling strategy also included a downwind urban site at Aldine. When the wind is blowing inland off of the Gulf of Mexico, emissions from both the Ship Channel industrial sector and the downtown urban core will be aged, reacted, and transported to the northwest. Of course, on the other hand, there is also the possibility that relatively clean air will be sampled at a site like Aldine when the wind is blowing to the southeast and toward the city. With the exception of the cut grass of the surrounding athletic fields, there is very little tall vegetation within a significant distance. The small dirt road directly beside the sampling site was used fairly frequently at various times of the day. The sampler was located on a ten-foot platform.

II.2.6 Conroe (C65)

Illustration II-13 Conroe regional map

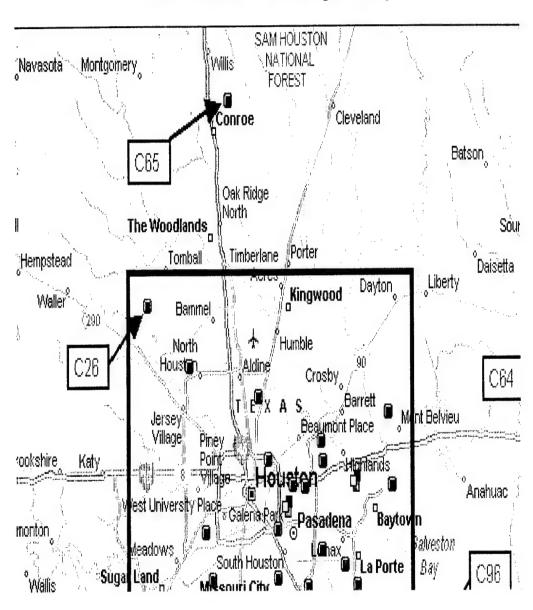


Illustration II-14 Conroe street map

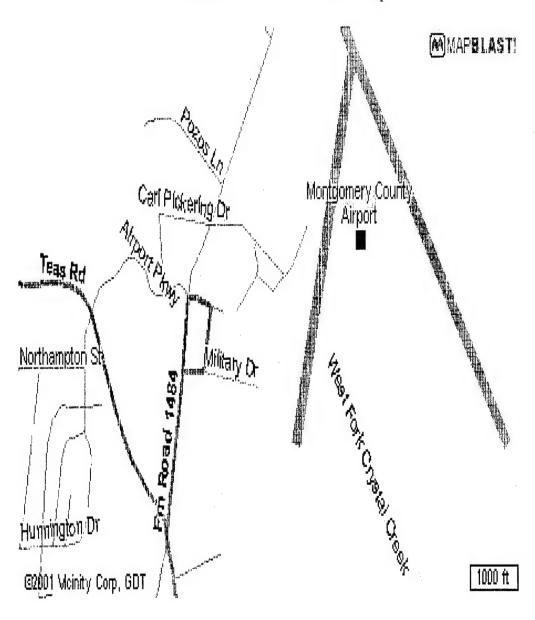
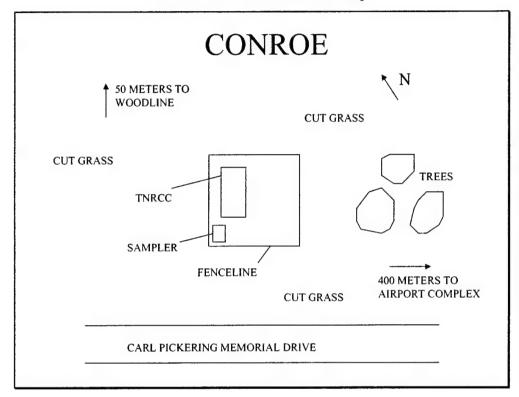


Illustration II-15 Conroe site map



With the overall intent of exploring the natural (vs. manmade) contribution to atmospheric chemistry in Southeast Texas, a sampling strategy has to include at least one site where a substantial amount of biogenic emissions is expected. The Conroe site, located beside the Montgomery County Airport, is in close proximity to the Sam Houston National Forest. The site is also located approximately forty to fifty miles from downtown Houston. Therefore, depending on the direction of the wind, an air sample collected from Conroe should not contain a significant amount of urban emissions. There is a substantial amount of tall trees immediately to the north-northeast of the site. The sampler was placed on the concrete pad.

II.3 SAMPLE COLLECTION

II.3.1 General

Both ambient air samples for VOC analysis and particulate matter samples were collected. The ambient air samples were collected into 32-liter stainless steel canisters for radiocarbon, or carbon-14, analysis of the nonmethane volatile organic carbon (NMOC) components in order to understand the distribution of the anthropogenic-biogenic sources of NMOCs. A major part of the strategy for collecting samples for radiocarbon analysis included reducing CO₂ levels as much as possible. Carbon dioxide is relatively abundant in the atmosphere (at levels of approximately 360 ppm), whereas total NMOC is about one thousand times smaller on a per carbon basis. ManTech personnel, who provided the training for field collection, provided equipment for a technique that they developed, which employs a lithium hydroxide (LiOH) scrubber to remove most of the CO₂ without unduly impacting the NMOC content. Particulate samples were collected with MSP® samplers in order to allow several subsequent analyses: organic carbon/elemental carbon (OC/EC) analysis, radiocarbon analysis of filter sections, and radiocarbon analysis of filter extracts. Gasoline and vegetation samples were also collected to allow better understanding of the VOC sources (Stiles, 2000).

II.3.2 Volatile Organic Carbons

II.3.2.1 Sampler, Scrubber, and Canister Preparation

The configuration of the equipment used to collect CO₂-free and direct ambient air samples is shown in Figure II-1. The system uses two Andersen

VOC samplers to fill the 32-liter canisters. Andersen sampler #813024 was modified by adding a LiOH scrubber and two valves to the sample transfer line. Andersen sampler #813022 was used to fill a canister directly. The two samplers were cleaned before being sent to the field by washing the inlets, filters, and transfer lines in deionized water and drying them in an oven at 100 °C. The samplers were then reassembled and purged with humidified scientific-grade air (HSGA) overnight. A sample of HSGA was then pumped by each sampler into the sample inlet of a Shimadzu GC-FID system and analyzed for total NMOC to confirm that the sampler contributes less than twenty ppbC to the total NMOC.

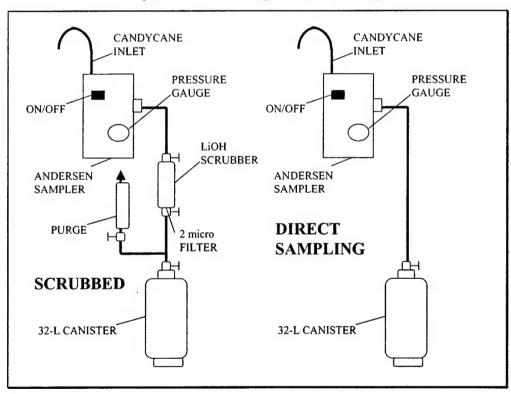


Figure II-1 VOC sample collection setup

Four LiOH scrubbers were constructed from 150-cc Whitney stainless steel tubes. Each Whitney cylinder was washed in deionized water and dried in an oven at 110 °C. Each tube was then filled with LiOH sieved to a granule size of 1-2 mm in diameter. A fresh supply of the LiOH, purchased from Cypress Foote, was opened on 20 JUL 2000 to begin making these scrubbers. Approximately130 cc of LiOH was added to the cylinder and each end was packed with glass wool. Each scrubber was conditioned by passing humidified, low-CO₂, scientific-grade air through the scrubber for several hours while maintaining the scrubber temperature at approximately 105 °C. After conditioning, each scrubber was allowed to cool down and then capped until used (Stiles, 2000).

Prior to use in the fieldwork, all 32-liter canisters were cleaned and tested for blank NMOC levels and for vacuum integrity. The following is a summary of the cleaning, evacuation, and certification procedure:

- Each can was first flushed of its original contents and partially refilled to approximately 0.5 atm with humidified scientific-grade air (HSGA) using a vacuum pump (Drytel Model 31).
- 2) Four canisters at a time were connected to a cleaning system manifold, placed in the oven, and allowed to hot soak at 150 °C for at least a couple of hours.
- After hot soaking, the vacuum pump was turned on, and the four canisters were evacuated while being heated. The evacuation process continued overnight until the manifold pressure reading was less than 25 mT.

- 4) The four canisters were taken out of the oven and allowed to cool while the next four cans were connected to the oven manifold and processed using steps one through four.
- 5) After cooling, each canister was refilled to approximately 15 psig with HSGA. The blank levels of total NMOC for each canister were measured and compared to the blank total NMOC levels of the HGSA using a Shimadzu GC-FID system.
- 6) If a canister contributed more than 20 ppbC to the blank NMOC levels, then the canister was reevacuated, refilled with the HSGA, and retested.
- 7) If a canister continued to have high blank NMOC levels, the can was recleaned using steps one through five. (Note: None of the canisters used for this study had to be reheated to pass the test.)
- 8) After a canister was certified to contribute less than 20 ppbC to the blank NMOC levels, it was reevacuated (one at a time) using a Drytel Model 31 vacuum pump. The canister was heated during the final evacuation by using the following setup: each can was connected to the vacuum pump with the canister valve and two isolation valves initially closed and placed inside of an open-topped five gallon metal container while hot air from a heat gun was blown across the outside of the canister. This provided enough heat to raise the canister temperature to approximately 50 °C and helped to remove water vapor from the canister.

- 9) The isolation valves on the manifold were opened, and the manifold was evacuated and checked for leaks before the canister valve was opened. After the canister valve was opened, the canister continued to be evacuated while being heated to approximately 50 °C until the pressure equilibrated to less than 12 mT. (This step took several hours.)
- 10) The canister and pressure sensor were then isolated from the vacuum pump, and the pressure was observed for about one minute. The pressure normally equilibrated in less than one minute. This measured pressure was recorded.
- 11) If the measured pressure was less than 12 mT, the canister valve was closed, the two isolation valves were closed to prevent an influx of room air, and the canister was disconnected from the manifold. The procedure for this canister continued with step fourteen while the next canister was installed to begin the evacuation procedure using steps eight through ten.
- 12) If the measured pressure was greater than 12 mT, the heating and evacuation procedure was continued at step nine for a few more hours.
- 13) If the pressure did not equilibrate, but continued to increase noticeably, the can was tagged to be repaired and recleaned because of a potential leak.

- 14) Each canister was allowed to sit for at least one day and then reconnected to the vacuum manifold of the Drytel Model 31 pump. The vacuum manifold lines were evacuated until the pressure equilibrated to less than 10 mT and also less than the previously recorded pressure for this canister. The manifold and sensor were then isolated from the vacuum pump, and the manifold pressure was observed to make certain that the connections did not leak. If no leaks were observed, the valve on the canister was opened and the canister pressure was measured.
- 15) As soon as the pressure reading stabilized, the pressure was observed, and the canister valve was closed. The pressure that was measured after at least one day was compared to the pressure measured earlier.
- 16) If the latest measured pressure was less than one mT larger than the previous value, then the canister was marked as clean and "leak free." A label indicating the cleaning date, final pressure, and total NMOC blank level was made and attached to the canister.
- 17) If the latest measured pressure was measurably larger than the previous measurement, the can was tagged to be repaired and recleaned because of a potential leak (Stiles, 2000).

II.3.2.2 Field Setup and Sample Collection

The Anderson VOC samplers were transported to the field study site in an EPA GC/MS sampling and analysis trailer. Upon arrival in Houston, both VOC samplers were set up at the Aldine site on a ten-foot platform. Later in the study, the Anderson samplers were moved to the Washburn Tunnel, HRM-3,

and Conroe sites in and near Houston to collect samples at different sites.

Appendix VI.1.1 lists the sampling times, locations, environmental conditions, and other useful parameters.

II.3.2.3 Sample Shipping and Storage

The 32-liter canisters were shipped back to Research Triangle Park, North Carolina, in custom boxes, three or four at a time via Federal Express. The CO₂ and TO-12 analysis (see Appendix VI.1.2) were performed as soon as possible, and feedback of the results was provided to the field personnel in Houston in order to ensure that acceptable levels of carbon dioxide were being removed by the LiOH scrubber. The canisters were eventually transferred for subsequent speciated nonmethane hydrocarbons using TO-14 techniques (see below).

II.3.2.4 Speciation

The Cryogen Gas Chromatographic-Flame Ionization Detection (Cryo GC-FID) System consists primarily of three components including the GC system, a preconcentration device, and a data integration system to determine VOC identification and concentration. Each component will now be described.

The gas chromatograph (GC) is a Hewlett-Packard Model 5890A Series II combined with flame ionization detection (FID). The GC column used in the system is a 0.32 millimeter inner diameter fused silica column containing a one micron DB-1 coating. In operation the column conditions consist of a -50°C initial temperature for two minutes followed by temperature programming to 200°C at a rate of 8°C per minute. After a 7.75 minute hold period, the column temperature is programmed to 225°C at a rate of 25°C per minute rate and held

at that temperature for eight minutes. These temperature conditions provide separation of the C₂-C₁₂ hydrocarbons, a major portion of the gas phase VOCs. Liquid nitrogen is used as the cryogen to obtain the sub-ambient temperatures required within the programming sequence. An electronic pressure control (EPC) device is used to maintain column head pressure of the helium carrier gas at a constant value of 150 kPa throughout the analysis period. The 150 kPa pressure provides a column flowrate of 2.65 cubic centimeters per minute at 75°C.

The FID requires the use of hydrogen and air for operation. To maximize response, a nitrogen makeup gas is recommended. For FID operation the flowrates for hydrogen, air, and nitrogen are adjusted to and maintained at 48, 325, and 30 cubic centimeters per minute, respectively. The detector is heated to and maintained at 275°C (Lonneman, 2000).

The preconcentration system consists of a six-port gas sample valve configured to use a packed glass bead trap in place of a sample loop. The sample valve is a low/dead volume, diaphragm valve selected for low maintenance and reliable operation. The glass bead trap consists of a 25 centimeter by 3.2 millimeter stainless steel trap packed with sixty to eighty mesh untreated glass beads. Other components of the preconcentration system include a ballast tank (approximate 1.8 liter volume), a diaphragm pump, and a vacuum gauge.

The components were arranged to isolate the ballast tank from the sample valve, and to selectively flow sample air or helium through the glass bead trap. A helium flow of 70 cubic centimeters per minute is routed through the trap in a backflush mode, compared to that of air sample flow during time periods other than air sample trapping.

Preconcentration operation steps are performed in the following sequence:

- 1) The ballast tank is isolated from the sample valve and is evacuated to a pressure of 40 millimeters Hg.
- 2) At the same time, the trap is immersed with a dewar of liquid argon (-187°C).
- 3) When the trap reaches liquid argon temperature equilibrium, the sample valve is switched to its inject position, helium trap flow is stopped, and sample air is drawn into the trap by the vacuum differential in the ballast tank.
- 4) When the gauge pressure reaches 60 millimeters Hg, the sample valve is pneumatically switched to its fill position routing sample air through the glass bead trap. Sample air flow through the trap is maintained at about 120 cubic centimeters per minute.
- 5) When the gauge pressure reaches 180 millimeters Hg, air flow through the trap is stopped.
- 6) A series of operations are performed including switching the valve to its inject position, removing the dewar containing liquid argon, and replacing it with a dewar containing hot water (100°C), in that sequence.
- 7) The trapped VOCs are injected onto the GC column maintained at 50°C, and the temperature programming sequence is started.
- 8) After a 2.25 minute injection time, the valve is switched back to its fill position, and the trap is flushed with helium to prepare for the next preconcentration sequence. Trap temperature during the 2.25 minute injection period generally decreases from 99 to 92°C.

Tests with both ambient air samples and known standard mixtures have shown that the 2.25 minute trap injection period is at least 0.5 minutes longer than the required time to quantitatively inject the C₂-C₁₂ hydrocarbons onto the GC column at the 99°C trap temperature (Lonneman, 2000).

Digital data provided by the Hewlett-Packard A/D board is accessed by the Chrom Perfect-5890 Direct chromatographic software program installed on the Hewlett-Packard Vectra Model 486/66XM IBM compatible computer. The chromatographic program acquires the time and voltage digital signal and electronically records the signal as RAW data files for later processing. The RAW data files are later accessed by chromatographic software and, using selectable threshold, peak width, and time event settings, GC peak areas are quantitatively integrated and stored along with retention times in AREA files. The AREA files are used by another software program, HCID, to name the GC peaks and convert peak areas to ppbC (Lonneman, 2000).

II.3.3 Particulate Matter

II.3.3.1 MSP Sampler Preparations

Two MSP Model 300 samplers were used in the field study. This model of MSP sampler operates nominally at 300 liters per minute and is configured to collect both a fine-fraction filter sample (particle aerodynamic diameters of 2.5 μm and below) and a coarse-fraction filter sample (particle aerodynamic diameters from 2.5 μm up to the upper cut point of the inlet). Each of the samplers was outfitted with a "rain hat" that is known to provide an upper cut point of approximately 10 μm (note that the exact value is not important for this study). The two samplers were marked with simple identifiers that allowed

their locations to be easily tracked through the field study. The first was labeled #1 and was identified with EPA property sticker 666781. The second was labeled #2, and it had EPA property identification 666783. These were the same samplers that had been used in a similar Nashville 1999 study (Stiles, 2000).

The two samplers were tested for proper mechanical operation at Research Triangle Park. For the Nashville study, only one of the two samplers had been modified to accept 90-mm-diameter filters for the collection of fine-fraction particulate matter. In preparation for the TEXAQS 2000 study, the second of the samplers was modified. Two 2.5-µm cut point impactor heads were used in the study; one was labeled with the manufacturer's serial number 027 and the second with 029. The first jet (where the pressure-drop sensing for flow control takes place) of head 029 was reepoxied to provide a more secure connection. All of the impactor jets for both heads were cleaned with Q-tips and solvent prior to the fieldwork (Stiles, 2000).

A supply of 90-mm prefired quartz filters for fine-fraction MSP sampling was heated to 500 °C and then placed in tight screw-top aluminum-foil-lined amber jars. Sections (2.5 by 6.5-inch) of quartz filter material for coarse-fraction sampling were cut from untreated 8 by 10 inch filters.

II.3.3.2 MSP Setup and Field Study Operations

The MSP samplers were transported to the field study site in the VOC GC/MS sampling and analysis trailer. Upon arrival in Houston, one MSP sampler was set up at the Aldine site on a ten-foot platform. Space in a nearby trailer was provided for loading and unloading filters and other preparations. The other MSP was set up initially at the Conroe site north of Houston. Later in

the study, the MSP samplers were moved to other sites. Appendix VI.2.1 lists the sampling times, locations, environmental conditions, and other useful parameters.

For a number of sampling episodes, the Omron timer hardware of the MSP sampler was used to start or finish runs automatically without the operator needing to be present. These runs are indicated by the word "Timer" in Appendix. Due to the use of this timer, many of the values for the "Initial" and "Final" magnehelix ratings that are reported represent the desired set points rather than the actual readings observed at the start/stop of a sampling period.

For the most part, the samplers operated satisfactorily. However, sampler #1, the "traveling" sampler that was relocated several times, exhibited many erratic readings of the major flow magnehelix. Almost continuously at times, the gauge would dip suddenly by about 10% and then return just as quickly to the set point. The changes seemed to occur faster than the blower could actually respond, so the impact on the total flow is unknown. Subsequent troubleshooting to date at Research Triangle Park has not identified the source of the problem or defined its impact, although it is still thought to be small (Stiles, 2000).

II.3.3.3 Sample Shipping and Storage

The 90-mm quartz filters were returned from the field via overnight Federal Express shipment, as two groups packed in a cooler filled with blue ice packs. Filters had been placed in individual petri dishes, each doubly wrapped with aluminum foil, labeled by date, time, and site, and placed as groups of approximately eight to ten in zip-lock freezer bags. The first return shipment showed that one of the blue ice packs had leaked. The outsides of the zip-lock

bags were wiped clean; the leakage did not appear to have an impact on the filter sample integrity. Coarse-fraction filter sections (2.5 by 6.5 inch) were retained by using the same storage techniques as the fine-fraction filters (Stiles, 2000).

II.3.3.4 C_eC_v (EC/OC) Analysis

A total of eighty-four samples were submitted to Sunset Laboratory for C_eC_v (EC/OC) analysis. They included seventy-three ambient field samples, two backup filter field samples, eight field blank samples, and a transportation blank. A group of four specified filters and six randomly selected filters were designated to have a duplicate analysis performed.

The terms "elemental carbon," "soot," "black carbon," and "light-absorbing carbon" in suspended particles are used loosely and often interchangeably by air quality, atmospheric, health, and industrial researchers. EC is not found in the atmosphere in its purest forms of diamond (four carbon bonds) or graphite (three carbon bonds). Atmospheric "elemental carbon" particles are commonly considered to be the product of incomplete combustion of carbon-containing fuels in an oxygen-starved environment. Organic carbon is considered nonabsorbing and more volatile than elemental carbon, although different researchers use different volatility cut-points for distinguishing between EC and OC. The sum of all components is total carbon (TC). Because definitive standards for OC and EC are lacking, these terms are defined by the method or protocol applied rather than as a fundamental quantity (Chow, 2001). Nevertheless, the EC/OC data provide some insight into whether or not primary combustion aerosol (soot) is significant.

The samples were delivered in an ice chest to Sunset for transfer to temporary storage in their cold freezer prior to analysis. Sunset was instructed to pick off any obvious debris from the filters, to select analysis sections (1 by 1.5 centimeters) from a noncentral area, and to apply NIOSH Method 5040. Analysis results were requested to be provided with no blank corrections being made (See Appendix VI.2.2). Sunset was instructed to return the remaining filter fractions to cold storage so that they could eventually be returned to the EPA for further disposition (Stiles, 2000).

II.3.3.5 Radiocarbon (14C) Measurements

In the interest of obtaining results quickly, twenty three filters were selected by the University of Texas to be sent from the EPA to the National Institute of Standards and Technology (NIST) to begin the process for Radiocarbon (¹⁴C) Measurements (all of the remaining filter samples will be analyzed at a later date). Four basic criteria were used to select the samples:

- 1) Varying Emission Signatures—anthropogenic industrial, anthropogenic mobile, biogenic, marine background, and fire events
- 2) Varying Sites—Aldine, Conroe, Galveston, and HRM-3
- 3) Varying Duration and Start Times—twenty-four hour sampling vs. six-hour sampling, and different start times of 0600, 1200, and 1800
- 4) Varying Elemental Carbon to Total Carbon Ratios—less than 0.1,0.1 to 0.2, and greater than 0.2 (note that higher ratios were assumed to indicate a higher proportion of soot from fossil fuel combustion)

EC/TC ratios were especially critical for choosing those samples that will provide a variety of ¹⁴C/¹²C scenarios to examine. The twenty-three samples chosen from the four different sites are shown in Table II-1.

Table II-1 Samples selected for priority analysis

SITE	SAMPLE NUMBER	DATE SAMPLED	EC/TC RATIO
Aldine	2	09-Aug-00	0.25
Aldine	6	12-Aug-00	0.11
Aldine	8	13-Aug-00	0.06
Aldine	11	14-Aug-00	0.12
Aldine	12	15-Aug-00	0.28
Aldine	17	18-Aug-00	0.09
Aldine	18	19-Aug-00	0.08
Aldine	25	23-Aug-00	0.11
Aldine	28	25-Aug-00	0.17
Conroe	3	09-Aug-00	0.15
Conroe	6	13-Aug-00	0.04
Conroe	7	13-Aug-00	0.03
Conroe	11	30-Aug-00	0.08
Galveston	1	20-Aug-00	0.10
Galveston	4	22-Aug-00	0.09
Galveston	7	24-Aug-00	0.12
HRM-3	5	18-Aug-00	0.14
HRM-3	10	05-Sep-00	0.10
HRM-3	11	06-Sep-00	0.08
HRM-3	12	07-Sep-00	0.16
HRM-3	13	07-Sep-00	0.06
HRM-3	14	08-Sep-00	0.09
HRM-3	16	13-Sep-00	0.20

Preparing carbonaceous material deposited on quartz fiber filters for ¹⁴C accelerator mass spectrometry (AMS) involves three separate steps: (1) the isolation of the carbon fraction of interest, (2) the combustion of sample carbon to CO₂, and (3) the subsequent reduction of the CO₂ to graphite, the form of carbon required for AMS analysis. Sample aliquots of sufficient area are taken from the ambient samples such that between 80 and 100 µg C may be

recoverable whenever possible. All samples are then treated to remove carbonate-bearing geological materials. Sample aliquots are subjected to hydrochloric acid fumes for six hours with subsequent neutralization using sodium hydroxide. The carbon remaining after this procedure is designated non-carbonate carbon. Aliquots are placed in precleaned quartz tubing, evacuated, and converted to CO₂ via combustion at 900°C using copper (II) oxide. The CO₂ is cryogenically distilled, quantified in a calibrated volume, and transferred to a quartz breakseal tube for storage prior to AMS target preparation.

Accelerator mass spectrometry measurements are performed using samples prepared as Fe-C bead targets instead of the normal pressed graphite powder. To minimize the target preparation blank, the Fe-C beads are produced using a closed system approach. The sample CO₂ is cryogenically transferred into a quartz reduction tube containing manganese (as the reducing agent) and iron wool catalyst, both of which were pretreated to minimize carbon artifacts. Batches of sample reduction tubes were placed into a furnace at 600°C for twenty-four to forty-eight hours where the CO₂ is reduced into graphitic carbon on the iron wool. The Fe wool-graphite matrix is magnetically separated from the manganese and sealed off under 10 kPa of ultrahigh purity helium. The fused target bead is then formed by melting the Fe wool-graphite in a resistive furnace at 1575°C for approximately one minute. Accelerator mass spectrometry measurements are then made at the University of Arizona-NSF AMS Facility (Klinedinst, 1999).

II.3.4 Gasoline Samples

II.3.4.1 Sample Collection

A set of fifteen gasoline samples was collected on 1 August and 2 August 2000. The samples represented low-octane, mid-octane, and premium grades for five of the major brands of gasoline sold in the Houston, Texas, area. For practical reasons, the selection of gasoline brands sampled was determined largely by their number of entries in the Yellow Pages of the Greater Houston phone book. The specific stations selected to represent each brand of gasoline were chosen on the basis of being in the approximate area of the Aldine sampling site. Approximately one gallon of fuel for each grade was pumped into the fuel tank of a rental vehicle before a one-pint sample was collected. Each sample was collected and stored in a tin-plated steel one-pint can with a screw cap.

II.3.4.2 Sample Shipping and Storage

For shipping, the cans were placed in a five-gallon plastic bucket with a tight-fitting cover. Sufficient vermiculite was added to each bucket to prevent movement of the cans during transport. Arrangements were made with Yellow Freight Systems for the shipping. Appropriate hazardous-shipping labels were attached to the buckets. Upon arrival at Research Triangle Park, the samples were stored in a flammables cabinet.

II.3.5 Vegetation Samples

Table II-2 lists the locations of tree leaf and other vegetation samples collected by George Klouda of NIST in August 2000. Samples were collected

in zip lock bags and taken to NIST for storage and analysis.

Table II-2 Vegetation sample details

Site	Where	Description
Aldine	From tree line across field southeast of samplers	Tree leaves
Conroe	From trees near site	Tree leaves
HRM-3	Bushes near rail tracks and sampler platform	Leaves
Laporte	Open field near site	Tall weeds

II.4 ADDITIONAL SOURCES OF DATA

II.4.1 General

There are three additional sources of data that will be repeatedly utilized within the results section. They are as follows: 1) TNRCC monitoring site data, 2) EPA SPECIATE source profiles, and 3) AIRS elemental composition data. All three sources will be described next in more detail.

II.4.2 TNRCC Monitoring Site Data

The Texas Natural Resource Conservation Commission maintains continuous measurements of many parameters, relevant to atmospheric science, at various monitoring stations throughout the state. This information is available at the TNRCC's website at www.tnrcc.state.tx.us. For this particular work, the meteorological data, as well as PM and ozone values, was extracted for all sampling sites, excluding the Washburn Tunnel, for the entire TEXAQS period of 7 August to 17 September 2000 (See Appendix VI.3 to VI.6).

II.4.3 EPA SPECIATE Source Profiles

The Environmental Protection Agency has made available through the website www.epa.gov/ttn/chief/software/speciate/index.html a software program entitled SPECIATE. This program contains 376 profiles of sources of particulate matter. A particular source profile can prove invaluable as a tool for making comparisons. For example, in order to assess whether or not a given filter sample contains traces of cigarette smoke, one can compare the elemental composition data of the sample with the standard elemental profile for cigarette smoke within SPECIATE to see how well the two sets of data match. The profiles of special interest in this case are those most closely associated with the production of young carbon (\frac{14}{C}) (See Appendix VI.7).

II.4.4 AIRS Elemental Composition Data

For a very limited number of days, the Aerometric Information Retrieval System contains elemental composition data for particulate matter sampled during the TEXAQS period at the various monitoring sites. Following EPA protocol, these values are FRM measurements from filters with a 2.5-micron cut point. X-ray fluorescence was used for quantifying trace elements. Ion chromatography was utilized for identifying nitrates, sulfates, and ammonium. Finally, OC and EC measurements were made with the same NIOSH Method 5040 mentioned in section II.3.3.4. All of the PM samplers that the TNRCC used to collect this information were co-located with the MSP samplers discussed within this work. Therefore, with a fairly high degree of certainty, it is reasonable to assume that elemental composition data from both sources would be virtually the same (See Appendix VI.8)

III RESULTS

III.1 SCOPE

The focus of this thesis is measuring the ¹⁴C/¹²C ratios in ambient atmospheric hydrocarbons and the use of these ratios in characterizing hydrocarbon sources. The information regarding hydrocarbon sources deduced from the ¹⁴C/¹²C ratios can be compared to information deduced from other atmospheric measurements that were described extensively in the methodology section.

This section describing the results will be structured in the following way. For a select group of sampling periods when extensive air quality measurements were made, ¹⁴C/¹²C ratios will be semi-quantitatively predicted. These predicted ratios will then be compared to the observed ¹⁴C/¹²C ratios.

III.2 PREDICTIONS

III.2.1 General

Out of the twenty-three filter samples initially prioritized for radiocarbon (¹⁴C) measurements, only eleven samples have sufficient ancillary data that allows for predictions of the ¹⁴C/¹²C ratios. Therefore, only these eleven samples will be discussed in this part of the results section: 18, 19, and 25 August for Aldine; 20 and 22 August for Galveston; 30 August for Conroe; and 5, 6, 7, 8, and 13 September for HRM-3. All of the remaining twelve samples lacked the necessary supporting data, at this time, required for making an estimate of biogenic fraction. However, the results generated by NIST for all twenty-three filter samples and two blanks, if available, will be presented.

III.2.2 Format

Each of the eleven samples discussed in detail will be analyzed on a case by case basis and shown separately. Initially, miscellaneous data such as sample time duration and day of the week will be mentioned. Appropriate meteorological data such as average temperature, average wind speed, and wind direction will follow. Elemental carbon/total carbon (EC/TC) and organic carbon/elemental carbon (OC/EC) ratios will be shown. Then, various sources of organic carbon will be examined, and a possible value for OC attributable to secondary organic aerosol (SOA) will be presented. Finally, a rough estimate or prediction will be made of the fraction of ¹⁴C or young carbon present. This process is intended to be qualitative in nature rather than quantitative.

III.2.3 Sources of 14C

III.2.3.1 General

When discussing sources of particulate matter containing young carbon (¹⁴C), there are both primary and secondary sources to consider. The main primary sources that are of concern for the purposes of this thesis are 1) forest fire activity, 2) cooking, and 3) vegetative detritus. Secondary sources require an estimate of secondary organic aerosol (SOA), and more specifically in this work, the fraction of the SOA that is due to biogenic emissions.

III.2.3.2 Organic Carbon Associated with Forest Fire Activity

Approximately half-way through the TEXAQS period (around 28 August to 5 September), there was substantial forest fire activity reported to the north/northeast of Houston. Depending on which way the wind was blowing for

any given day, these fires could have generated particulate matter collected in the samples. The Conroe site, located north of Houston, was particularly susceptible. To assess the contribution of the forest fire activity to the particulate matter collected, a standard profile of the elemental composition for "Forest Prescribed Burning-Broadcast Conifer" can be compared to elemental profiles for the collected samples (refer to Appendix VI.7.1 for SPECIATE data). The data in the appendix indicates that aside from a fairly large OC/EC ratio of approximately 9.343, there should be significant amounts of potassium, nitrates, and chlorine, with trace levels of sulfur, calcium, aluminum, and zinc.

III.2.3.3 Organic Carbon Associated with Cooking

An additional source of ¹⁴C is the anthropogenic activity of cooking. Especially in an urban environment with a large population and a considerable number of restaurants, the organic carbon produced from cooking cannot be dismissed as trivial. A standard profile of the elemental composition for "Meat Cooking-Charbroiling" contains no elemental carbon and significant amounts of magnesium, chlorine, copper, and sodium (refer to Appendix VI.7.2 for SPECIATE data). A profile for "Meat Cooking-Frying" also contains no elemental carbon and significant amounts of chlorine, nitrates, sulfates, and barium (refer to Appendix VI.7.3 for SPECIATE data).

III.2.3.4 Organic Carbon Associated with Vegetative Detritus

Perhaps slightly less crucial than the impact of forest fire and cooking activity is the possibility of vegetative detritus. This process can be defined many different ways from the impact of strong winds breaking apart loose vegetation to the particulate matter created when moving a lawn. Particles

from this source are expected to be large, typically greater than $2.5~\mu m$. Regardless, a speciated filter sample should be checked for signs of this activity. A standard profile of the elemental composition for "Vegetative Detritus" shows a very large OC/EC ratio of 34.468 and contains significant amounts of silicon, iron, aluminum, calcium, copper, potassium, and zinc (refer to Appendix VI.7.4 for SPECIATE data).

III.2.3.5 Organic Carbon Associated with Elemental Carbon

For almost every process that produces elemental carbon, man-made or otherwise, there is typically a certain amount of organic carbon that is also present. In this work, all EC is assumed to be fossil carbon, and a characteristic OC/EC ratio for primary fossil carbon sources is assumed. Based on data collected and assembled by the EPA on particulate matter source profiles (SPECIATE), the ratio of organic carbon to elemental carbon can vary extensively from 2.53 for tire wear to 0.369 for jet aircraft, and everything in between. A fairly conservative average that includes many of the processes associated with an urban environment and its surroundings is 1.2. This value will be used in this work to create an upper bound to the possible biogenic fraction eventually estimated.

III.2.3.6 Biogenic Fraction of Secondary Organic Aerosol

Reiterating the fact that this portion of the analysis will be very qualitative in nature, the two main pieces of corroborating evidence for assessing a biogenic fraction of the SOA will include VOC data, when available and applicable and ozone data. To estimate the fraction of the SOA that might be due to biogenic emissions, all potential biogenic precursors of SOA should

be analyzed. These include isoprene from deciduous, or broadleaf, trees, as well as, α -pinene, β -pinene, and sesquiterpenes from conifers. Unfortunately, only measurements of isoprene are available.

At the Aldine site isoprene concentrations were near zero in the VOC samples analyzed by the TNRCC. At the Clinton site, a site not utilized for this thesis but located very near HRM-3, there were some substantial levels of isoprene reported. However, the peak concentrations seemed to occur primarily in the morning hours, and the day-to-day values were extremely inconsistent. For example, on 5 September 2000 the concentration at 1400 was 8.6 ppbC, but the following day, the concentration at 1400 was 0.13 ppbC. This type of pattern suggests that there may be an anthropogenic source of isoprene within the vicinity of the Clinton, and therefore HRM-3, site. From this, an assumption is made that SOA from the emissions of broadleaf trees is near zero, for the Aldine and HRM-3 sites, but the contributions from pines are unknown.

III.2.4 Aldine

III.2.4.1 18 August 2000

III.2.4.1.1 General

This sample was a six-hour sample taken from 1200-1800 on a Friday. The average temperature was 94.850 °F with a high of 96.7 °F at 1500. The average wind speed was 6.133 mph with a high of 9.1mph at 1700. For most of the sampling period the wind was blowing from the south/southeast, from the general direction of the ship channel and the urban core. The EC/TC ratio was 0.106 and the OC/EC ratio was 8.471. Both of these values seem reasonable on the surface. On one hand, the OC/EC ratio seems a little high given that for almost all of the sampling period the wind is carrying primary industrial and anthropogenic emissions from the southeast. However, taking into account that the average temperature was very high and the sample is primarily an afternoon sample when biogenic emissions are most significant, it is reasonable to expect significant secondary aerosol production.

III.2.4.1.2 Sources of Organic Carbon

For this particular filter sample, forest fire activity, cooking, and vegetative detritus do not appear to be much of a factor. The sampling occurred before the forest fire activity that occurred later on in the month. The elemental composition data does not match very well with the standard profiles for cooking. It lacks the magnesium and sodium normally associated with charbroiling. Frying also requires traces of sodium, and the barium level (0.151%) was too low to match its significance within the SPECIATE profile.

Considerable amounts of silicon, aluminum, and iron suggest the possibility of vegetative detritus. However, the lack of similar levels of copper, calcium, and zinc suggests otherwise.

III.2.4.1.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 4.6 μ g/m³ organic carbon. Assuming that fossil organic carbon is associated with the fossil elemental carbon (0.543 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 4.6 – (0.543)(1.2) = 3.948 μ g/m³. Given that the average ozone value for the sampling period was 90.8 ppb with a high of 111 ppb at 1500 when the temperature high also occurred, a substantial amount of secondary aerosol formation is plausible.

III.2.4.2 19 August 2000

III.2.4.2.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Saturday. The average temperature was 84.163 °F with a high of 96.3 °F at 1500. The average wind speed was 3.650 mph with a high of 8.8 mph at 1700. For the early morning hours to mid-afternoon (1500), the wind was blowing from the southwest. For the remainder of the day, the wind came from the southeast initially and gradually shifted from the south. These wind patterns do not exactly match the normal land-sea breeze shift observed in this area. The EC/TC ratio was 0.067 and the OC/EC ratio was 13.835. Both of these values seem reasonable. Since the sample occurred on a Saturday, there is a strong possibility that industrial and anthropogenic sources were not as prevalent as they might be on a weekday. With biogenic emissions remaining the same

regardless of what day of the week it is, an increase in the OC/EC ratio should be expected.

III.2.4.2.2 Sources of Organic Carbon

Similar to the 18 August sample, previously mentioned sources of organic carbon do not appear to be much of a factor. The sampling occurred before the forest fire activity that occurred later on in the month. As with 18 August, the elemental composition data does not match very well with the standard profiles for cooking. It too lacks the magnesium and sodium normally associated with charbroiling. Frying also requires traces of sodium, and the barium level (0.103%) was even lower than the 18 August sample. Considerable amounts of silicon, aluminum, and iron suggest the possibility of vegetative detritus. However, the lack of similar levels of copper, calcium, and zinc suggests otherwise.

III.2.4.2.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained $4.69 \,\mu\text{g/m}^3$ organic carbon. Assuming that fossil organic carbon is associated with the fossil elemental carbon $(0.339 \,\mu\text{g/m}^3)$ multiplied by 1.2), the OC from SOA is estimated to be: $4.69 - (0.339)(1.2) = 4.283 \,\mu\text{g/m}^3$. Given that the average ozone value for the sampling period was 51.3 ppb (compared to a 24-hour average of 38.3 ppb for 18 August) with a high of 122 ppb at 1600, a substantial amount of aerosol formation is plausible. At the very least, the fraction of SOA in this sample should be more than the 18 August sample due to a much larger 24-hour ozone average.

III.2.4.3 25 August 2000

III.2.4.3.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Friday. The average temperature was 82.717 °F with a high of 92.8 °F at 1500. The average wind speed was 3.383 mph with a high of 9.4 mph at 1600. For the early morning hours to early afternoon (1300), the wind was blowing from the northeast/east, and throughout the remainder of the day, it gradually shifted to originating from the southeast/south. These wind patterns were a little closer to the normal land-sea breeze oscillation observed in this area. The EC/TC ratio was 0.160 and the OC/EC ratio was 5.236. Again, both of these values seem reasonable. The presence of higher levels of elemental carbon, compared to 18 and 19 August, is consistent with a full 24-hour dose of weekday industrial and anthropogenic emissions. Also, out of the three Aldine samples, the average temperature is lowest for this sample (by almost 2 °F). This difference could reduce the amount of biogenic emissions.

III.2.4.3.2 Sources of Organic Carbon

The date of this sample is approaching the point when forest fire activity is conceivable. However, a lack of the potassium coupled with a very low OC/EC ratio makes the fire scenario unlikely. Signs of cooking activity seem to appear here. Trace levels of magnesium and levels of 0.111% copper and 0.448% sodium might indicate charbroiling. Frying is even more plausible given levels of 0.225%, 0.448%, and 0.221% of barium, sodium, and potassium, respectively. A complete lack of aluminum discredits the option of including vegetative detritus.

III.2.4.3.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 3.77 μ g/m³ organic carbon. Accounting for other sources of OC, such as cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0.72 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 4.69 – (0.339)(1.2) – (0.0226)(124.783) = **0.086** μ g/m³. Initially, despite the condition that the 24-hour ozone average (38.042 ppb) is the lowest of the three Aldine sampling events mentioned, this value seems a little low. The factor of 124.783 taken from the standard frying profile is probably too large. However, it is not unreasonable to estimate that this sample will, in fact, have the lowest amount of OC associated with SOA for the three Aldine samples.

III.2.4.4 Aldine Summary

Table III-1 displays some of the data for all three sampling periods discussed in this section.

Table III-1 Aldine summary

DATE	DAY	ТҮРЕ	TEMP Avg (°F)	WIND Avg (mph)	OC/EC	SOA (μg/m³)
18 Aug	Fri	6-HR	94.850	6.133	8.471	3.948
19 Aug	Sat	24-HR	84.163	3.650	13.835	4.283
25 Aug	Fri	24-HR	82.717	3.383	5.236	0.086

Based on the information presented within this section, the sample taken on 19 August most likely had the highest biogenic fraction, and the sample collected on 25 August probably had the lowest (although, the strong evidence of a cooking profile may lead to a significant ¹⁴C level in this sample). The OC/EC ratios alone seem to suggest the same predictions. As mentioned previously, VOC data for the Aldine site suggests that isoprene levels are close to zero on any given day. Therefore, in the absence of forest fire activity, significant cooking related particulate matter, and vegetative detritus, almost all of the young carbon measured on the filters will have to be attributed to biogenic emissions from sources such as conifer trees.

III.2.5 Galveston

III.2.5.1 20 August 2000

III.2.5.1.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Sunday. The average temperature was 84.758 °F with a high of 87.2 °F at 1400. The average wind speed was 10.963 mph with a high of 13.7 mph at 0300. For the early morning hours to late morning (1100), the wind was blowing from the southwest. For the remainder of the day, the wind came from the south. These wind patterns do not exactly match the normal land-sea breeze shift observed in this area. The EC/TC ratio was 0.102 and the OC/EC ratio was 8.789. Both of these values might be explainable. Given that the sampling day is a Sunday and that the wind seems to be originating primarily from Galveston Bay, the expectation is that elemental carbon levels would be lower than shown here.

However, there is a substantial portion of the day from around 0600 to 0900 when the wind does shift briefly all the way to the northwest where anthropogenic emission sources are present.

III.2.5.1.2 Sources of Organic Carbon

In the absence of significant wind from inland, an assumption can be made that none of the sources of organic carbon mentioned previously, to include forest fires, cooking, and vegetative detritus, will be necessary for consideration with this sample. This statement does not imply the complete lack of these emission sources, it merely suggests that they will most likely not be present at significant levels.

III.2.5.1.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 1.67 μ g/m³ organic carbon. Assuming that fossil organic carbon is associated with the fossil elemental carbon (0.19 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 1.67 – (0.19)(1.2) = **1.442 \mug/m³**. The average ozone value for the sampling period was 30.1 ppb (not that much lower than the 24-hour averages for Aldine), but the high was only 42 ppb at 1000. The fraction of the aerosol that is biogenic in origin will almost completely depend on what the wind is passing over from Galveston Bay. An anthropogenic source such as ship traffic might be conceivable.

III.2.5.2 22 August 2000

III.2.5.2.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Tuesday. The average temperature was 84.942 °F with a high of 86.6 °F at 1400. The average wind speed was 7.942 mph with a high of 10.5 mph at 1600. For the early morning hours to 0500, the wind was blowing from the southeast. For the remainder of the day, the wind came from the east. These wind patterns do not exactly match the normal land-sea breeze shift observed in this area. The EC/TC ratio was 0.074 and the OC/EC ratio was 12.574. Both of these values seem reasonable. For a majority of the day the wind is blowing from the east, directly from Galveston Bay, where the possibility of elemental carbon from anthropogenic sources is very slim

III.2.5.2.2 Sources of Organic Carbon

In the absence of significant wind from inland, an assumption can be made that none of the sources of organic carbon mentioned previously, to include forest fires, cooking, and vegetative detritus, will be necessary for consideration with this sample. This statement does not imply the complete lack of these emission sources, it merely suggests that they will most likely not be present at significant levels.

III.2.5.2.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 2.54 μ g/m³ organic carbon. Assuming that fossil organic carbon is associated with the fossil elemental carbon (0.202 μ g/m³

multiplied by 1.2), the OC from SOA is estimated to be: $2.54 - (0.202)(1.2) = 2.298 \,\mu\text{g/m}^3$. Given that the average ozone value for the sampling period was 59.542 ppb (much higher than the 20 August Galveston sample) with a high of 72 ppb at 1000, a reasonable amount of aerosol formation is plausible. The fraction of the aerosol that is biogenic in origin will almost completely depend on what the wind is passing over from Galveston Bay. An anthropogenic source such as ship traffic might be conceivable.

III.2.5.3 Galveston Summary

Table III-2 displays some of the data for both sampling periods discussed in this section.

TEMP WIND SOA **DATE** DAY **TYPE** OC/EC Avg $(\mu g/m^3)$ Avg (°F) (mph) 24-HR 84.758 10.963 8.789 1.442 20 Aug Sun Tue 24-HR 84.942 7.942 12.574 2.298 22 Aug

Table III-2 Galveston summary

Based on the information presented within this section, the sample taken on 22 August probably had a higher biogenic fraction then the 20 August sample. The OC/EC ratios alone seem to suggest the same prediction. Even with the total absence of VOC data, the possibility of a significant biogenic fraction is conceivable. Particularly the 22 August sample, where the wind passes over land very little enroute to the sampler, might show a substantial

marine biogenic contribution. Particulate matter attributable to forest fire activity, cooking, or vegetative detritus is unlikely. Even traces of isoprene, α -pinene, β -pinene, and sesquiterpenes seem doubtful.

III.2.6 Conroe—30 August 2000

III.2.6.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Wednesday. The average temperature was 88.558 °F with a high of 103 °F at 1600. The average wind speed was 4.004 mph with a high of 7 mph at 1000. The wind was blowing from the southwest almost the entire day. The EC/TC ratio was 0.059 and the OC/EC ratio was 15.824. These two values seem a little more extreme than some of the numbers reported for the other sites. However, the wind does not really originate from Houston where most of the anthropogenic contributions of elemental carbon might be expected. This date was also a very hot day, and the site was in the vicinity of forestry capable of significant biogenic emissions.

III.2.6.2 Sources of Organic Carbon

The possibility of the sample containing particulate matter generated by forest fire activity in the near vicinity is likely. The elemental composition (particularly potassium—0.588%) for the sample matches well with the standard SPECIATE profile, but even more convincing is the particulate matter evidence. Briefly from 1800-2000, the wind shifts drastically to blowing from the east/northeast where much of the fire incidents were occurring. The PM levels, which had been very low all day, suddenly jump from 4.67 μ g/m³ at

1800 all the way to a high of 26.92 μ g/m³ by 2100.

Signs of cooking activity seem to appear here, as well. The absence of magnesium and slight trace amounts of copper (0.005%) seem to make charbroiling improbable. However, with the necessary level of barium (0.321%), compared to the standard SPECIATE profile, and a lot of sodium (1.199%), frying should probably be considered. Low levels of aluminum, copper, and zinc do not suggest that vegetative detritus is significant for this sample.

III.2.6.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 2.88 μ g/m³ organic carbon. Accounting for other sources of OC, such as fire activity (OC/potassium ratio of 82.939) and cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0..182 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 2.88 – (0.182)(1.2) – (0.049)(82.939) - (0.0268)(124.783) = 0μ g/m³. Even disregarding the possibility of cooking and reducing the factor used to include fire activity down to 54.318, the OC from SOA would still be zero. The high for ozone at this site was only 75 ppb.

III.2.6.4 Conroe Summary

Given the very large OC/EC ratio and the close proximity of biogenic emitting sources, the assumption that the biogenic fraction of this filter sample is high seems completely justifiable. However, in the absence of supporting VOC data for this site, the evidence is substantial that a majority of the particulate matter collected on this sample can be attributed to forest fire activity within the area.

III.2.7 HRM-3

III.2.7.1 5 September 2000

III.2.7.1.1 General

This sample was a six-hour sample taken from 1200-1800 on a Tuesday. The average temperature was 99.467 °F with a high of 106.7 °F at 1300. The average wind speed was 4.467 mph with a high of 6.3 mph at 1300. The wind was blowing from the northeast initially until around 1600 when it shifted slightly to blowing from the east. The EC/TC ratio was 0.116 and the OC/EC ratio was 7.590. These values are justifiable in that higher levels of elemental carbon are expected in this highly industrial area. However, the OC/EC ratio is higher than that of the 25 August sample taken at Aldine (a suburban location), suggesting perhaps an unexpected source of organic carbon.

III.2.7.1.2 Sources of Organic Carbon

Despite this sampling site's fairly distant location south of where most of the forest fire activity was reported, the possibility of particulate matter collected at HRM-3 containing young carbon originating from this source cannot be ignored. Prior to this sampling period, the wind blew from the north all morning, and PM from the fires was in the region. The potassium level (0.653) is high enough to suggest agreement with the standard SPECIATE profile.

The evidence for cooking activity is present. Trace levels of magnesium (0.093%) and copper (0.008%) do not really suggest charbroiling as significant, but amounts of barium (0.217%) and sodium (0.825%) matched against the

standard SPECIATE profile will support the assumption of frying. The low levels of aluminum and zinc, and the near absence of copper does not make vegetative detritus likely.

III.2.7.1.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 9.26 μ g/m³ organic carbon. Accounting for other sources of OC, such as fire activity (OC/potassium ratio of 82.939) and cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (1.22 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 9.26 – (1.22)(1.2) – (0.163)(82.939) - (0.0543)(124.783) = **0** μ g/m³. If the assumption of forest fire activity impacting this sample is incorrect, the SOA may be as high as 1.02 μ g/m³, still not a large value. Reducing the factor (82.939) used to include fire activity may increase its plausibility. Given that the average ozone value for the sampling period was 101.5 ppb with a high of 130 ppb at 1400, a reasonable amount of SOA would probably be anticipated.

III.2.7.2 6 September 2000

III.2.7.2.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Wednesday. The average temperature was 88.65 °F with a high of 94 °F at 1500. The average wind speed was 3.967 mph with a high of 6.1 mph at 1900. The wind was blowing from the northeast, shifting to originating from the east, until around 1600, when it changed to blowing slightly from the southeast for about six hours before returning to coming from the northeast again. The

EC/TC ratio was 0.065 and the OC/EC ratio was 14.423. These values seem extreme and begin to rival the rural numbers seen at the Conroe site. However, substantial forest fire particulate matter could easily justify a lot of OC.

III.2.7.2.2 Sources of Organic Carbon

Despite this sampling site's fairly distant location south of where most of the forest fire activity was reported, the possibility of particulate matter collected at HRM-3 containing young carbon originating from this source cannot be ignored. However, lacking the substantial wind from the north that the 5 September sample had, the potassium level (0.421) is slightly lower than the previous day, suggesting less of an impact on this sample.

The evidence for cooking activity is low. Trace levels of magnesium (0.010%) and copper (0.003%) are even lower than the 5 September sample and, therefore, do not suggest charbroiling. Furthermore, amounts of barium (0..089%) and sodium (0.338%) show a very weak match with the standard SPECIATE profile and will not support the assumption of frying. A complete lack of aluminum discredits the option of including vegetative detritus.

III.2.7.2.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 12 μ g/m³ organic carbon. Accounting for other sources of OC, such as fire activity (OC/potassium ratio of 82.939), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0.832 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: $12 - (0.832)(1.2) - (0.157)(82.939) = \mathbf{0} \, \mu$ g/m³. If the assumption of forest fire activity impacting this sample is incorrect, the SOA may be as high as 11.002 μ g/m³, a very large value. Unfortunately, ozone data were not available.

III.2.7.3 7 September 2000

III.2.7.3.1 General

This sample was a six-hour sample taken from 0600-1200 on a Thursday. The average temperature was 84.417 °F with a high of 90.7 °F at 1200. The average wind speed was 7.450 mph with a high of 7.1 mph at 1200. The wind was blowing from the northeast for the entire sampling period. The EC/TC ratio was 0.072 and the OC/EC ratio was 12.815. These values are a slight decrease from the 6 September sample. However, a fairly substantial source of organic carbon needs to be accounted for again.

III.2.7.3.2 Sources of Organic Carbon

As stated previously for the 5 and 6 September samples, the possibility of particulate matter collected at HRM-3 containing young carbon originating from this source cannot be ignored. Fair winds from the north/northeast were present, and the potassium level (0.622) is high enough to suggest agreement with the standard SPECIATE profile.

The evidence for cooking activity is slightly better than the 6 September sample. The complete absence of magnesium rules out the option of considering charbroiling, but the amounts of barium (0.139%) and sodium (0.691%) matched against the standard SPECIATE profile make frying difficult to ignore. The near absence of aluminum (0.003%) discredits the option of including vegetative detritus.

III.2.7.3.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 6.1 μ g/m³ organic carbon. Accounting for other sources of OC, such as fire activity (OC/potassium ratio of 82.939) and cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0.476 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 6.1 – (0.476)(1.2) – (0.0835)(82.939) - (0.0186)(124.783) = 0μ g/m³. If the assumption of forest fire activity impacting this sample is incorrect, the SOA may be as high as 3.208 μ g/m³. Reducing the factor (82.939) used to include fire activity may increase its plausibility. Unfortunately, ozone data were not available.

III.2.7.4 8 September 2000

III.2.7.4.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Friday. The average temperature was 78.767 °F with a high of 86.2 °F at 1400. The average wind speed was 5.088 mph with a high of 7.2 mph at 1100. The wind was blowing from the northeast for the entire day. The EC/TC ratio was 0.067 and the OC/EC ratio was 13.993. These values seem consistent with the previous two days. However, in sharp contrast, the amount of organic carbon collected on the filter sample was substantially less.

III.2.7.4.2 Sources of Organic Carbon

For the first time in several days, the effect of the forest fire activity shows strong signs of dissipation in this sample. Despite a wind pattern similar to the 5, 6, and 7 September samples, the amount of loading of organic carbon

seems quite small for a full 24-hour sample. Even the potassium level (0.310%) drops to a questionable match with the standard SPECIATE profile.

The evidence for cooking activity is very similar to the 7 September sample. The complete absence of magnesium rules out the option of considering charbroiling, but the amounts of barium (0.220%) and sodium (0.743%) matched against the standard SPECIATE profile make frying difficult to ignore. The near absence of aluminum (0.004%) discredits the option of including vegetative detritus.

III.2.7.4.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 3.89 μ g/m³ organic carbon. Accounting for other sources of OC, such as cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0.278 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 3.89 – (0.278)(1.2) - (0.0262)(124.783) = **0.287** μ g/m³. This SOA value seems reasonable. Given the fairly low average temperature, ozone levels were probably not that high that day, corresponding to low levels of SOA. Unfortunately, ozone data were not available.

III.2.7.5 13 September 2000

III.2.7.5.1 General

This sample was a 24-hour sample taken from 2400-2400 on a Wednesday. The average temperature was 77.908 °F with a high of 81 °F at 1500. The average wind speed was 3.334 mph with a high of 7.7 mph at 0100. The wind was highly erratic throughout almost the entire day until around 1800

when it blew from the northeast for the remainder of the day. The EC/TC ratio was 0.201 and the OC/EC ratio was 3.983. These values appear to be much more consistent with a site located in the middle of a major industrial area.

III.2.7.5.2 Sources of Organic Carbon

Once again, almost all traces of forest fire activity seem to be removed. The organic carbon loading is low again, and the potassium level (0.191%) drops to a very poor match with the standard SPECIATE profile. The evidence for cooking activity is fairly strong. The magnesium (0.018%) and copper (0.011%) levels render charbroiling possible, but probably not significant. The amounts of barium (0.283%) and sodium (1.808%) matched against the standard SPECIATE profile make quite a strong case for frying. The complete absence of aluminum discredits the option of including vegetative detritus.

III.2.7.5.3 Biogenic Fraction of Secondary Organic Aerosol

The sample contained 2.88 μ g/m³ organic carbon. Accounting for other sources of OC, such as cooking (OC/barium ratio of 124.783), and assuming that fossil organic carbon is associated with the fossil elemental carbon (0.723 μ g/m³ multiplied by 1.2), the OC from SOA is estimated to be: 2.88 – (0.723)(1.2) - (0.026)(124.783) = 0μ g/m³. An SOA value of zero is not that difficult to accept in this case. Ozone levels were almost non-existent that day with a 24-hour average of 7.1 ppb and a maximum value of 26 ppb. Also, almost the entire quantity of OC collected on the filter can be attributed to cooking for this particular sample.

III.2.7.6 HRM-3 Summary

Table III-3 displays some of the data for all five sampling periods discussed in this section.

Table III-3 HRM-3 summary

DATE	DAY	ТҮРЕ	TEMP Avg (°F)	WIND Avg (mph)	OC/EC	SOA (μg/m³)
5 Sep	Tue	6-HR	99.467	4.467	7.590	0
6 Sep	Wed	24-HR	88.65	3.967	14.423	0
7 Sep	Thu	6-HR	84.417	7.45	12.815	0
8 Sep	Fri	24-HR	78.767	5.088	13.993	0.287
13 Sep	Wed	24-HR	77.908	3.334	3.983	0

HRM-3 is by far the most complex site to analyze in this situation for several reasons. Initial logic suggests that since this site is located within close proximity of the Houston ship channel, a major industrial complex, that large amounts of fossil carbon would be collected on filter samples and that particulate matter of biogenic origin would be virtually non-existent. However, the forest fire activity that occurred north/northeast of Houston toward the end of August, beginning of September 2000, may have had an impact on samples collected within that timeframe. Unusually large amounts of organic carbon, and thus high OC/EC ratios, would seem to support this assertion. VOC data from the nearby Clinton site may complicate matters further. Anthropogenic isoprene may lead to SOA, which may lead to particulate matter, which appears to be biogenic in origin.

Regardless of the fact that the method used in this section to determine SOA led to zero values for four out of the five samples, a qualitative comparison of biogenic fraction among the samples may still be possible. A ranking of highest biogenic fraction to lowest might be: 1) 6 September (highest OC/EC ratio and strong evidence of forest fire particulate matter),

- 2) 7 September (next highest OC/EC ratio with strong evidence of fire PM),
- 3) 5 September (third highest OC/EC ratio with strong evidence of fire PM),
- 4) 8 September (actually second highest OC/EC ratio, but very little OC loading, and weak evidence of forest fire particulate matter), and
- 5) 13 September (absolute lowest OC/EC ratio and essentially no evidence of forest fire particulate matter). The actual order of the samples collected on 5, 6, and 7 September could certainly vary, but the fact that the biogenic fraction for all three of those samples is probably higher than the 8 and 13 September samples will not change.

III.3 ¹⁴C OBSERVATIONS

III.3.1 Preliminary ¹⁴C Data

Out of the twenty-three samples, plus two blanks, selected for ¹⁴C measurements. Only the nine Aldine samples and two of the Conroe samples have been completed by NIST at this time. The data are presented in Table III-4.

Table III-4 14C data

SITE	DATE	% BIOGENIC	UNCERTAINTY
Aldine	9 August	33	2
Aldine	12 August	55	4
Aldine	13 August	68	1
Aldine	14 August	50	10
Aldine	15 August	25	2
Aldine	18 August	46	4
Aldine	19 August	57	2
Aldine	23 August	57	1
Aldine	25 August	37	2
Conroe	9 August	41	2
Conroe	13 August	72	4

III.3.2 Analysis

Clearly, biogenic emissions play a crucial role as a source of particulate matter for the Aldine and Conroe sites. All eleven samples were taken prior to the forest fire event that occurred during the TEXAQS period. Very little evidence was found for vegetative detritus as a source of organic carbon in any of the samples for which trace metal data are available. Also, as previously discussed, little evidence of cooking emissions is seen in the trace metal analyses for the 18 and 19 August samples at Aldine, and only small contributions from cooking are expected for 25 August. Therefore, with the exception of accounting for the possibility of small amounts of young carbon

(¹⁴C) produced by cooking activity, the remainder of the particulate matter must be attributed to secondary organic aerosol at Aldine and Conroe on these dates, and a significant portion of that SOA must be biogenic in origin. As mentioned previously, VOC data do not indicate the presence of significant levels of isoprene at Aldine, suggesting conifer trees provide substantial biogenic emissions. In the case of Conroe, there were several occasions during the TEXAQS period when large isoprene concentrations were detected by aircraft, in isolated regions, north of Houston in the vicinity of the sampling site. Therefore, isoprene emissions and other emissions from deciduous vegetation may be a source of biogenic SOA in isolated areas north of Houston.

III.4 COMPARISONS

Of the eleven samples that have biogenic fractions reported within Table III-4, only three (Aldine—18, 19 and 25 August) were discussed in the predictions section. The Aldine summary (Section III.2.4.4) stated that the 19 August sample would have the highest biogenic fraction, and that the 25 August sample would have the lowest. Table III-4 confirms this prediction with the 19 August sample being 57% (± 2%) biogenic, and the 25 August sample being 37% (± 2%) biogenic.

IV CONCLUSIONS

The primary goal of this thesis was to predict the amount of ¹⁴C present within the canister (VOC) and filter (PM) samples taken as part of TEXAQS 2000 from five different sites in and around Houston, Texas. These predicted values were to be compared to actual results from a portion of the samples selected for ¹⁴C measurement.

Due to many different factors, including a tremendous lack of ancillary data necessary for making adequate predictions, the main objective stated above was only truly achieved for three samples taken at the Aldine site in suburban Houston, Texas on 18, 19, and 25 August 2000. For this limited set, the predictions and observations were in strong agreement, describing qualitatively which samples were most likely to contain the highest and the lowest biogenic fractions.

In addition to the direct effort aimed at achieving the stated research goals, several other qualitative conclusions regarding source attribution may be reported here:

- For those filter samples collected in late August and early September 2000, the contribution of particulate matter originating from forest fire activity to the north/northeast of Houston is likely to be substantial.
- 2) The anthropogenic source of meat cooking, especially frying, is not always a significant source of particulate matter containing organic carbon. However, there were several samples that cooking activity could not be ignored and had to be considered.
- Vegetative detritus was never a significant source of particulate matter for the eleven samples that had elemental composition data.

- 4) Biogenic emissions of isoprene from deciduous, or broadleaf, trees are probably not a significant contributor of secondary organic aerosol, and therefore particulate matter, at any of the sites that were sampled at other than Conroe, north of Houston.
- 5) Secondary organic aerosol that cannot be attributed to any other source is probably biogenic in origin. Without measurable levels of isoprene, conifer emissions such as α-pinene, β-pinene, and sesquiterpenes may be responsible.

Despite what seems to be an obvious conclusion that biogenic emissions play a role in the formation of particulate matter via secondary organic aerosol, the exact significance, or to what level of importance, this process has for urban and/or regional atmospheric chemistry was not addressed within this thesis. However, more and more, major metropolitan areas, such as Houston located near the Sam Houston National Forest, are opting to investigate the impact of biogenic emissions when examining control strategies and/or modeling that address their air pollution concerns.

V RECOMMENDATIONS

With any project, this thesis has probably created more questions than it has answered. This work can be used as a basis for many other areas of research, and it contains some invaluable data sets for easy reference, to include, meteorological, ozone, and particulate matter data, for four out of the five sampling sites, for almost the entire TEXAQS period.

Some of the results of the various processes mentioned within the methodology section have yet to be reported, such as, VOC speciation data from the canister samples taken at all five sites, to include the Washburn Tunnel, and ¹⁴C measurements for all of the quartz filter samples, not just the twenty-three selected for priority analysis. Both of these data sets could be invaluable for continuing this research or pursuing a completely different approach toward analyzing the contribution of biogenic emissions to atmospheric chemistry in and around Houston, Texas.

The single most interesting possibility for future research that has arisen as a direct consequence of the results section is the issue of secondary organic aerosol, that has no definite precursor, at a site such as Aldine. As stated previously, α -pinene, β -pinene, and sesquiterpenes could be biogenic emissions responsible for what appears to be a substantial biogenic fraction observed for the particulate matter. Measurements should be made to confirm or deny the presence of conifer emissions.

Lastly, as an aside, the fairly unique aspect of forest fire activity and its implication for urban and/or regional atmospheric chemistry should be examined more thoroughly. This thesis suggests the strong possibility that some of the samples collected for ¹⁴C measurements actually contain particulate matter generated from forest fire activity.

VI APPENDIX

VI.1 VOC DATA

VI.1.1 VOC Sample Collection Information

VI.1.2 VOC Preliminary Results

VI.1.1 VOC Sample Collection Information

1 08/01/00 02.15 PM Aldine DCS partly cloudy, light breez 2 08/10/00 12.00 PM Aldine KRL sunny & clear, somewh 3 08/12/00 12.00 PM Aldine KRL sunny, low to moderate 4 08/14/00 09:00 AM Aldine KRL mostly cloudy, light to mostly cloudy cloudy, light to mostly cloudy, light hose cloudy, mod haze kRL lost-zoo on the cloudy and haldine kRL lost-zoo on the cloudy mostly cloudy, light hose cloudy, mostly cloudy, light hose cloudy, mod haze light lost-zoo on the cloudy and haldine lost light lost-zoo on the cloudy cloudy, light hose cloudy, mostly cloudy, light hose cloudy cloudy, light h	ر کے کہ کے کہ کے کہ ایک ایک بنات کی ایک بنات بنات بنات بنات بنات	S &	DCS [partly cloudy, light breeze, mid to high 90's (deg F) (relatively clean air following rainstorm on previous evening)
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8 08/16/00 12:00 PM Aldi 9 08/18/00 12:30 PM Aldi 10 08/22/00 12:00 PM Aldi 12 08/22/00 09:20 AM Aldi 13 08/22/00 12:40 PM Aldi 14 08/22/00 12:40 PM Aldi 15 08/22/00 12:00 PM Aldi 16 08/26/00 09:00 AM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 23 08/26/00 09:00 PM Aldi 24 08/26/00 09:00 PM Aldi 25 08/26/00 09:00 PM Aldi 26 09/26/00 09:00 PM Aldi 27 08/26/00 09:00 PM Aldi 28 08/26/00 09:00 PM Aldi 29 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 20 08/26/00 08:00 PM Aldi		KRL	mostly cloudy; light to moderate breeze, high 80's
9 08/16/00 12:30 PM Aldi 10 08/20/00 12:00 PM Aldi 12 08/22/00 09:20 AM Aldi 13 08/22/00 09:20 AM Aldi 14 08/22/00 09:00 PM Aldi 15 08/22/00 12:00 PM Aldi 16 08/26/00 09:00 PM Aldi 17 08/26/00 09:00 PM Aldi 19 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 24 08/26/00 09:00 PM Aldi 25 08/28/00 12:00 PM Aldi 26 08/28/00 12:00 PM Aldi 27 08/26/00 09:00 PM Aldi 28 08/28/00 12:00 PM Aldi 29 08/28/00 12:20 PM Aldi		KRL	partly cloudy, light to moderate to hazy, very light to light breeze, mid to high 90's
10 08/20/00 12:00 PM Aldi 11 08/22/00 09:20 AM Aldi 13 08/22/00 09:20 AM Aldi 14 08/22/00 12:00 PM Aldi 15 08/22/00 12:00 PM Aldi 16 08/26/00 09:00 AM Aldi 17 08/26/00 09:00 AM Aldi 19 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/28/00 12:00 PM Aldi 23 08/28/00 12:00 PM Aldi 24 08/28/00 12:00 PM Aldi 25 08/28/00 12:00 PM Aldi 26 08/28/00 12:00 PM Aldi 27 08/28/00 12:00 PM Aldi 28 08/28/00 12:00 PM Aldi 29 08/28/00 12:00 PM HRR 29 08/28/00 12:00 PM HRR		KRL.	KRL sunny, moderately hazy, light breeze, high 90's
11 08/22/00 09:20 AM Aldi 12 08/22/00 09:20 AM Aldi 13 08/22/00 12:40 PM Aldi 14 08/22/00 12:00 PM Aldi 15 08/24/00 12:00 PM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 23 08/26/00 09:00 PM Aldi 24 08/26/00 09:00 PM Aldi 25 08/26/00 09:00 PM Aldi 26 09/04/00 12:00 PM Aldi 27 08/26/00 09:00 PM Aldi 28 08/26/00 09:00 PM Aldi 29 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 23 08/26/00 09:00 PM Aldi 24 08/26/00 09:00 PM Aldi 25 08/26/00 09:00 PM Aldi 26 09/04/00 12:00 PM HRI 27 09/04/00 09:00 AM HRI 28 09/12/00 09:00 AM HRI 29 09/12/00 09:00 AM HRI 30 09/12/00 09:00 AM HRI		KRL	KRL partly cloudy, light to moderate haze; light breeze; low to mid 90's
12 08/22/00 09:20 AM Aldis 08/22/00 12:40 PM Aldis 14 08/22/00 12:00 PM Aldis 15 08/22/00 12:00 PM Aldis 15 08/22/00 12:00 PM Aldis 16 08/22/00 12:00 PM Aldis 18 08/22/00 09:00 AM Aldis 19 08/22/00 09:00 PM Aldis 19 08/22/00 09:00 AM ALTIS 19 08/22/00 12:20 PM ALT		KRL KR	KRL partly cloudy to mostly overcast by 1115, mod to heavy haze (barely see downtown from hwy 510); light breeze; low to mid 90's
13 08/22/00 12:40 PM Aldi 14 08/22/00 09:00 PM Aldi 15 08/24/00 12:00 PM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 AM Aldi 20 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 23 08/26/00 09:00 PM Aldi 24 08/26/00 03:00 PM Aldi 25 08/31/00 03:00 PM Aldi 26 09/04/00 12:00 PM Aldi 27 09/04/00 12:00 PM Aldi 28 09/04/00 12:00 PM Aldi 29 09/04/00 12:00 PM Aldi 29 09/04/00 12:00 PM Aldi 29 09/04/00 12:00 PM HRR 29 09/04/00 13:00 PM HRR 29 09/04/00 13:00 PM HRR 29 09/04/00 13:00 PM HRR 29 09/04/00 12:00 PM HRR		KRL	KRL partly cloudy to mostly overcast by 1115, mod to heavy haze (barely see downtown from twy 610), light breeze, low to mid 90's
14 08/22/00 09:00 PM Aldi 15 08/24/00 12:00 PM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 AM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 23 08/26/00 09:00 PM Aldi 24 08/26/00 03:00 PM Aldi 25 08/31/00 03:00 PM WVT 26 09/04/00 12:00 PM HRI 27 09/04/00 12:00 PM HRI 28 09/02/00 03:00 PM HRI 29 09/02/00 03:00 PM HRI 29 09/02/00 03:00 PM HRI 29 09/02/00 12:00 PM HRI 29 09/02/00 03:00 PM HRI 20 09/02/00 03:00 PM HRI		KRL	KRL lovercast; light to moderate haze; light breeze;mid 90's; threatening rain (actually did rain in other parts of city)
15 08/24/00 12:00 PM Aldi 16 08/24/00 12:00 PM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 PM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 09:00 PM Aldi 22 08/26/00 12:00 PM Aldi 23 08/26/00 03:00 PM Aldi 24 08/29/00 03:00 PM Aldi 25 08/31/00 03:00 PM WV.1 26 09/04/00 12:00 PM HRI 27 09/04/00 12:00 PM HRI 28 09/05/00 03:00 PM HRI 29 09/04/00 12:00 PM HRI 20 09/04/00 12:00 PM HRI 20 09/04/00 12:00 PM HRI 20 09/04/00 12:00 PM HRI		KRL	KRL Imostly cloudy, light breeze, high 80's
16 08/24/00 12:00 PM Aldi 17 08/26/00 09:00 AM Aldi 18 08/26/00 09:00 AM Aldi 20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/26/00 12:00 PM Aldi 23 08/26/00 12:00 PM Aldi 24 08/26/00 12:00 PM Aldi 25 08/31/00 03:00 PM W/17 26 09/04/00 12:00 PM W/18 27 09/04/00 13:00 PM W/18 28 09/04/00 12:00 PM HRB 29 09/04/00 12:00 PM HRB 29 09/04/00 12:00 PM HRB 29 09/04/00 12:00 PM HRB 30 09/12/00 08:00 AM HRB 30 09/12/00 08:00 AM HRB 30 09/12/00 12:20 PM HRB		KR.	KRL Inostly cloudy, mod haze, very light breeze, low to mid 90's, last 15-20 minutes of run was overcast w thunderstorm on its way
17 08/26/00 09:00 AM Aldia 18 08/26/00 09:00 AM Aldia 20 08/26/00 09:00 PM Aldia 21 08/26/00 09:00 PM Aldia 22 08/28/00 12:00 PM Aldia 23 08/28/00 12:00 PM Aldia 24 08/28/00 12:00 PM Aldia 24 08/28/00 03:00 PM WAI 25 08/31/00 03:00 PM WAI 26 09/04/00 12:00 PM HRB 27 09/04/00 12:00 PM HRB 28 09/05/00 03:00 AM HRB 29 09/05/00 03:00 AM HRB 30 09/12/00 03:00 AM HRB 30 09/12/00 03:00 AM HRB		Ŕ.	KRL mostly cloudy, mod haze, very light breeze, low to mid 90's, last 15-20 minutes of run was overcast w thunderstorm on its way
18 08/26/00 09:00 AM Aldi 20 08/26/00 12:30 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/28/00 12:00 PM Aldi 23 08/28/00 12:00 PM Aldi 24 08/28/00 03:15 PM W/1 25 08/31/00 03:15 PM W/1 26 09/04/00 12:00 PM HRB 27 09/04/00 12:00 PM HRB 28 09/05/00 03:00 PM HRB 29 09/05/00 03:00 PM HRB 29 09/05/00 03:00 PM HRB 29 09/05/00 03:00 PM HRB 30 09/12/00 03:00 AM HRB 30 09/12/00 03:00 AM HRB 30 09/12/00 03:00 AM HRB		KRL	KRL sunny, very light haze (clearest five seen downtown in a while); very light breeze, low to mid 90's
19 08/26/00 12:30 PM Aldi 20 08/26/00 09:00 PM Aldi 22 08/26/00 12:00 PM Aldi 23 08/28/00 12:00 PM Aldi 24 08/29/00 03:15 PM W/1 25 08/31/00 03:00 PM W/1 26 09/04/00 12:00 PM HRR 27 09/04/00 12:00 PM HRR 28 09/05/00 03:00 PM HRR 29 09/05/00 03:00 PM HRR 29 09/05/00 03:00 PM HRR 30 09/12/00 03:00 PM HRR		KRL	sunny, very light haze (clearest five seen downtown in a while), very light breaze, low to mid 90's
20 08/26/00 09:00 PM Aldi 21 08/26/00 09:00 PM Aldi 22 08/28/00 12:00 PM Aldi 23 08/28/00 12:00 PM Aldi 24 08/28/00 03:15 PM W/1 25 08/31/00 03:00 PM W/1 26 09/04/00 12:00 PM W/1 27 09/04/00 03:00 PM W/8 27 09/04/00 03:00 PM W/8 28 09/05/00 03:00 PM W/8 39 09/12/00 03:00 PM W/8 30 09/12/00 03:00 PM W/8 30 09/12/00 03:00 PM W/8		KRL	partly cloudy, yery light haze, very light to light breeze, low to mid 90's
21 08/26/00 09:00 PM Aldi 22 08/28/00 12:00 PM Aldi 23 08/28/00 12:00 PM Aldi 24 08/29/00 03:15 PM W1 25 08/31/00 03:00 PM W1 26 09/04/00 12:00 PM HR9 27 09/04/00 09:15 PM HR9 28 09/05/00 09:00 AM HR9 29 09/12/00 12:00 PM HR9 30 09/12/00 12:00 PM HR9 30 09/12/00 12:00 PM HR9 30 09/12/00 12:00 PM HR9		KRL	clear, light to moderate breeze high to mid 80's
22 08/28/00 12:00 PM Aldi 23 08/28/00 12:00 PM Add 24 08/29/00 03:15 PM W1 25 08/31/00 03:00 PM W1 26 09/04/00 12:00 PM HRB 27 09/04/00 09:15 PM HRB 28 09/05/00 09:00 AM HRB 29 09/12/00 09:00 AM HRB 30 09/12/00 12:20 PM HRB		KR	KRL clear, light to moderate breeze,high to mid 80's
23 08/28/00 12:00 PM Aldi 24 08/29/00 03:15 PM W.T 25 08/21/00 03:00 PM WTI 26 09/04/00 12:00 PM HRN 27 09/04/00 09:05 PM HRN 28 09/12/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN 30 09/12/00 12:20 PM HRN 30 09/12/00 12:20 PM HRN		Ŕ	KRL partly cloudy, light haze, light breeze, mid 90's
24 08/29/00 03.15 PM W.T 25 08/31/00 03:00 PM W.T 26 09/04/00 12:00 PM HRN 27 09/05/00 09:15 PM HRN 28 09/12/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN 30 09/12/00 12:20 PM HRN		KRL	KRL partly cloudy; light haze, light breeze; mid 90's
25 08/31/00 03:00 PM W.T 26 09/04/00 12:00 PM HRN 27 09/04/00 09:15 PM HRN 28 09/05/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN	V.Tun*	KRL	ndoor, low 90's; no AC
26 09/04/00 12:00 PM HRN 27 09/04/00 09:15 PM HRN 28 09/05/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN	V.Tun*	KRL	ndoor, mid 90's
27 09/04/00 09:15 PM HRN 28 09/05/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN		KRL	KRL surny; light haze,\(\) light to moderate breeze; mid to high 90's
29 09/12/00 09:00 AM HRN 29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN		KRL	KRL clear, light kreeze, high 80's, industrial smell
29 09/12/00 09:00 AM HRN 30 09/12/00 12:20 PM HRN		KRL	KRL sunny, moderate haze, very light breeze, mid to high 90's
30 09/12/00 12:20 PM HRN		KR.	KRL partly cloudy, light haze, very light breeze, low to mid 90's, not much smell (unusual for this site)
		KR.	KRL mostly cloudy, light haze, light breeze, high 90's, @1430 light sprinkle, moderate breeze
31 09/12/00 12:20 PM HRM3		χ Έ	mostly cloudy, light haze; light breeze; high 90's; @1430 light sprinkle; moderate breeze
32 09/14/00 09:45 AM Conroe KRL	onroe		mostly cloudy, light haze, very light breeze, low to mid 90's
33 09/14/00 09:45 AM Cor	onroe !	KRL	33 09/14/00 09:45 AM Conroe KRL Inostly cloudy; light haze, very light breeze; low to mid 90's

VI.1.1 VOC Sample Collection Information

1					check (mT)	check (mT) @3min ('''Hg @end (psi) (LPM)	(Zend (psi)	(LPM)	(LPM)	
†										
=	813024	927054 tx1	tx1	180	9	-12	35	0.462		0.462 No problems
7	813024	922283 tx1	tx1	184	4	-12	35	0.462	0.462	0.462 Comment C2
3	813024	922287 t×1	tx1	180	7	-12	35	0.462	0.462	0.462 No problems
4	813024	919756 tx1	tx1	180	8	-12	35	0.462		0.462 No problems
5	813024	922284 tx1	tx1	180	6	-12	35	0.462	0.462	0.462 No problems
9	813024	922276 tx1	tx1	180	7	-12	35	0.462		0.462 Comment C6
7	813022	922281 none	auou	180	7	-26	26	0.462		0.462 No problems
8	813024	922275 tx1	tx1	180	7	-12	35	0.462		0.462 comment C8
6	813024	922277 tx1	tx1	180	8	-12	35	0.462		0.462 comment C9
10	813024	922282 tx1	1×1	180	2	-12	35	0.462		0.462 No problems
11	813024	919754 tx1	tx1	180	6	-12	35	0.462		0.462 No problems
12	813022	927052 none	none	180	9	-26	26	0.462		0.462 No problems
13	813024	922274 tx1	tx1	180	4	-12	35	0.462		0.462 No problems
14	813024	922279 tx1	tx1	180	6	-12	35	0.462		0.462 No problems
15	813024	23992 tx2	2×1	180	12	11-	34	0.462		0.462 No problems
16	813022	2072 none	none	180	9	72-	25	0.462		0.462 No problems
17	813024	3995 tx2	tx2	180	9	-11	35	0.462		0.462 No problems
18	813022	919752 none	none	180	6	-26	28	0.462		0.462 No problems
19	813024	3989 tx2	tx2	180	8	-12	35	0.462		0.462 No problems
2	813024	919755 tx2	tx2	180	7	-11	35	0.462		0.462 No problems
21	813022	919751 none	none	180	4	-26		0.462		0.462 No problems
22	813024	919757 tx2	tx2	180	8	-11	35	0.462		0.462 No problems
23	813022	2074 none	none	180	5	-27	28	0.462		0.462 No problems
24	813024	919753 tx2	tx2	180	5	-12	35	0.462		0.462 No problems
52	813024	3990 tx2	tx2	180	4	-12	35	0.462		0.462 No problems
56	813024	3993 tx2	tx2	180	5	-12	35	0.462	0.462	No problems
27	813024	2071 tx2	tx2	180	5	-12	35	0.462	0.462	No problems
28	813024	927051 tx2	tx2	180	6	-11	35	0.462	0.462	No problems
29	813024	922286 tx3	tx3	180	4	-12	35	0.462	0.462	No problems
8	813024	2073 tx3	tx3	180	4	-12	35	0.462	0.462	No problems
હ	813022	927050 none	none	180	3	-26	26	0.462	0.462	No problems
32	813024	927054r tx3	tx3	180	6	-12	35	0.462		0.462 No problems
33	813022	3994 0000		001	1	000	11			

VI.1.1 VOC Sample Collection Information

* Washburn Tunnel

- C2 Valve (on can) was very tight. Had to use pipe wrench; very difficult to open slowly when starting run. With 22 minutes remaining on run, without me knowing it, an electrician shut off power to the platform for 3-5 minutes.
- <u>C6</u> DCS (David Stiles of ManTech) found valve loose and probably leaking out sample when this sample arrived at ERC Annex; CO₂ looks good.
- <u>C8</u> Beginning to notice that the flow is weakening; pressure doesn't drop very much with all valves open. I'm wondering if purge tube filled with LiOH is clogging up somewhat.
- <u>C9</u> I was right on about the extra LiOH in the purge tube (take it off and everything runs like normal). Made this run with it on anyway (might hurt purge cycle); sort of fixed it afterward.

VI.1.2 VOC Preliminary Results

Run ID	CO2 Scru	bbed	CO2 Unsc	rubbed	T012		T012	C02
	mean	sdm	mean	sdm	mean	sdm	scr./dir.	per
	(ppb)	(ppb)	(ppm)	(ppm)	(ppb)	(ppb)		total C
1	34	6			106	5		0.24
2	105	6			1420	7		0.07
3	63	6			193	5		0.25
4	91	6			213	5		0.30
5		6			139	5		0.22
6	66	6			202	5	0.92	0.25
7			378	0.5	220	5		
8	75	6			96	5		0.44
9	41	6			103	5		0.28
10		6			64	5		0.56
11	75	6			150	5	0.97	0.33
12			357	0.5	154	5		
13	116	6			108	5		0.52
14		6			340	5		0.16
15	46	6			110	5	0.88	0.30
16			356	0.5	125	5		
17	56				109	5	0.92	0.34
18		6	360	0.5	118	5		
19	964				123	5		
20		6			99	5	0.85	0.19
21			360	0.5	116	5		
22		6			72	5	0.82	0.62
23			350	0.5	88	5		
24					4127	27		0.03
25		6			4384	27		0.04
26		6			177	5		0.17
27		6			483	7		0.24
28		6			272	5		0.08
29		6			327	5		0.37
30	141	6			245	5	0.82	0.37
31			363	0.5	298	5		
32		6			89	5	0.80	0.23
33			368	0.5	111	5		
	82 **		361		454		0.87	0.27 **
stan dev	49 **		8		1009		0.06	0.15 **

^{**}without run 19

- VI.2 PM DATA
- VI.2.1 PM Sample Collection Information
- VI.2.2 PM Preliminary Results

VI.2.1 PM Sample Collection Information

		1			
				(min)	
Aldine	5	August 8 0600	0000	360	mostly cloudy, very light breeze, high 80s-low 90s, couldn't process sample until 1400 because of thunderstorm activity
Aldine	05	02 August 9 0000	0000	1440	partly cloudy, very light breeze; low 90s; couldn't process sample until 0115
Aldine	8	03 August 10 0600	0000	360	clear and sunny but moderately hazy, light breeze, low 90s
Aldine	ð	04 August 10 1220	1220	-300	clear and sunny but moderately hazy, light to moderate breeze, mid 90s, electrician shut off power for -1 hour 1630-1730
Aldine	8	04 August 10 1220	1220	-300	clear and sunny but moderately hazy, light to moderate breeze, mid 90s; electrician shut off power for -1 hour 1630-1730
Aldine	છ	05 August 11 0000	0000	1440	@1130 partly cloudy, moderately hazy, very light breeze, mid 90s, @1900-2100 thuderstorm activity, @2100-2200 light rain
Aldine	90	06 August 12 0600	090	360	sunny, light to moderate haze, very light breeze; low 90s
Aldine	07	07 August 12 1215	1215	360	surmy, light to moderate haze, very light breeze, low 90s
Aldine	0	Aldine 07 August 12 1215	1215	380	surmy, light to moderate haze, very light breeze, low 90s
Aldine	8	Aldine 08 August 13 0000	0000	1440	@1400. sunny, light haze, light breeze, mid 90s
Aldine	8	Aldine 08 August 13 0000	0000	1440	@1400. sunny, light haze, light breeze, mid 90s
Aldine	8	09 August 14 0600	0090	360	partly cloudy to mostly @1100, moderately hazy, light to moderate breeze @1130, mid 90s
Aldine	=	Aldine 11 August 14 1820	1820	330	mostly cloudy, light to moderate breeze, high 80s
Aldine	12	Aldine 12 August 15 0015	0015	1425	@1300: mostly cloudy
Aldine	3	Aldine 13 August 16 0600	0000	360	partly cloudy, light to moderate haze, very light breeze, mid 90s
Aldine	4	Aldine 14 August 16 1215	1215	360	partly cloudy, moderate to very hazy, very light to light breeze, mid to high 90s
Aldine	15	Aldine 15 August 17 0000	0000	1440	sunny, light heze; light breeze, mid to high 90s
Aldine	9	Aldine 16 August 18 0600	0090	360	sunny, moderate haze, light breeze, low to mid 90s
Aldine	=	Aldine 17 August 18 1215	1215	380	sunny, moderate haze, iight breeze, high 90s
Aldine	9	Aldine 18 August 19 0000	0000	1440	@1250; sunny, moderate haze; very light breeze; high 90s
Aldine	49	Aldine 19 August 20 0600	0090	380	partly cloudy, light to moderate haze, fight breeze, low 90s, filter lighter in color than most AM samples here
Aldine	20	Aldine 20 August 20 1215	1215	360	partity cloudy, light to moderate haze, very light breeze, mid to low 90s, filter lighter in color than morning sample
Aldine 21		August 20 1830	1830	330	mostly cloudy, light breeze, high 80s
Aldine	22	22 August 21 0020	0020	1420	@1340; partly cloudy, light haze, light breeze, mid 90s
Aldine	23	23 August 22 0600	0090	380	mostly cloudy, moderate to heavy haze, light breeze, low 90s
Aldine	24	24 August 22 1215	1215	360	overcast (1215-1530) to partly cloudy (1530-1815); light to moderate haze, light breeze, mid 90s; threatened rain but never delivered
Aldine	52	Aldine 25 August 23 0000	0000	1440	thunderstorm activity throughout the city but not here; overcast @1345; very light breeze
Aldine	26	Aldine 26 August 24 0500	0090	380	mostly cloudy, light to moderate haze, very light to light breeze, high 80s to low 90s
Aldine	27	Aldine 27 August 24 1215	1215	360	@1430. thunderstorm activity began: light rain on and off (heavy at one point); moderate breeze at one time, light rain from 1700 on; high 80s

VI.2.1 PM Sample Collection Information

SITE	# DAT	TIM	E BURATION	ID # DATE TIME BURATION ENVIRONMENTAL CONDITIONS DURING SAMPLING
Aldine 2	28 August 25 0000	25 0000	1440	@1834: partly cloudy, light haze, light breeze, high 80s
Aldine 29 August 26 0600	9 August	26 0600	360	surny, very light haze (clearest five seen downtown in a while); very light breeze, high 80s to low 90s
Aldine 3	Aldine 30 August 26 1215	26 121	360	partly cloudy, light haze, light breeze, mid to high 90s
Aldine 31 August 26 1830	1 August	26 1830	330	clear, light to moderate breeze, high to mid 80s
Aldine 3	Aldine 32 August 27 0015	27 001	5 1425	@1000, partly cloudy, very light haze, light breeze, low 90s
Aldine 3	Aldine 33 August 28 0600	28 0600	360	partly cloudy, light haze, light to moderate breeze, low to mid 90s.
Aldine 3	Aldine 34 August 28 1215	28 121	380	partly cloudy, light haze, light breeze, mid to low 90s
Aldine 3	34 August 28 1215	28 121	360	partly cloudy, light haze, light breeze, mid to low 90s
Aldine 3	35 August 29 0000	29 000	1440	mostly clear, hot, upper 90s, light winds, light haze
Aldine 3	36 August 30 0600	30 060	360	clear, hot, 100s today, light winds, haze
Aldine 3	Aldine 36 August 30 0600	30 060	380	clear, hot, 100s today, light winds; haze
Aldine 3	37 August 30 1215	30 121	360	clear, very hot (~100), light winds, haze
Aldine 3	38 August 31 0000	31 000	02.20	partly cloudy, light to moderate haze, light breeze, low to mid 90s
Conroe 0	Conroe 01 August 8 0600	£ 8 060	098 0	mostly cloudy, almost no breeze, low 90s
Conroe 0	Conroe 02 August 8 1215	t 8 121	380	almost overcast most of the sampling period, some thunderstorm activity, high 80s, no breeze
Conroe 0	Conroe 03 August 9 0000	4 9 000	1440	@1100. partly cloudy, very light breeze; low 90s
Conroe 0	Conroe 04 August 11 0600	11 060	360	scattered clouds; light haze, light breeze, low 90s
Conroe 0	Conroe 05 August 11 1250	111 125	360	partly to mostly cloudy, light haze, very light breeze, mid 90s
Conroe 0	Conroe 05 August 11 1250	11 125	380	pertly to mostly cloudy, light haze, very light breeze, mid 90s
Conroe 0	Conroe 06 August 13 0600	13 060	380	sunny, almost no haze; light breeze, low 90s
Conroe 0	Conroe 07 August 13 1215	13 121	360	surny, almost no haze; light breeze, mid 90s
Conroe 0	Conroe 08 August 27 0600	27 0600	360	partly cloudy, light haze; light breeze; high 80s to low 90s
Conroe 0	Conroe 09 August 27 1215	27 121	360	partly cloudy, light haze, light to moderate breeze, mid to low 90s
Conroe 1	Canroe 10 August 29 0600	29 060	360	surny, light haze, light breeze, low to mid 90s
Conroe 1	Conroe 11 August 30 0000	30 000	1440	unknownin Austin all day
Conroe 1	Conroe 12 August 31 0600	31 0600	380	partly cloudy, light haze, light breeze, low to mid 90s
Conroe 1	Conroe 12 August 31 0600	31 060	380	partly cloudy, light haze, light breeze, low to mid 90s
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VI.2.1 PM Sample Collection Information

SITE	# 0	DATE	TIME	DURATION	TIME DURATION ENVIRONMENTAL CONDITIONS DURING SAMPLING
Galves	2	Galves 01 August 20 0000	000	1440	@1000. mostly cloudy, light haze; light breeze, high 80s; couldn't process sample until 0140
Galves	8	Salvest 02 August 21 0600	0090	360	mostly cloudy, light haze, light breeze, low 90s
Galves	8	Salvest 03 August 21 1215	1215	360	mostly cloudy, light haze, light breeze, mid 90s
Galves	83	Oalvest 03 August 21 1215	1215	360	mostly cloudy, light haze, light breeze, mid 90s
Galves	8	Galvest 04 August 22 0000	0000	1440	@1400; mostly cloudy, light haze, light to moderate breeze, mid 90s; threatened rain at one point
Galves	20	Oalvest 05 August 23 0600	0090	360	thunderstorm activity with showers all morning, light breeze, low 90s
Galvest	90	Galves 06 August 23 1215	1215	360	mostly cloudy, light haze, light to moderate breeze, high 80s
Galves	7 20	Oalves 07 August 24 0000	0000	1440	@0830. nostly cloudy, light haze, very light breeze, high 80s, thunderstorm activity up north @ Aldine but not sure how it impacted Galveston
Galvesi	80	Galves 08 August 25 0600	0090	360	partly cloudy, light haze, light breeze, high 80s
HRM3	5	August 15 0600	0090	360	mostly cloudy, moderate haze, light breeze, low 90s, industrial smell
HRM3		02 August 15 1215	1215	360	mostly cloudy, modetate haze, light breeze, low 90s, couldn't process sample until 2300
HRM3	8	03 August 17 0600	0990	360	very sunny, light haze, light kreeze; industrial smell
HRM3		04 August 17 1215	1215	360	surny, light haze, light breeze, industrial smell
HRM3		04 August 17 1215	1215	360	sunny, light haze; light breeze, industrial smell
HRM3		05 August 18 0000	00	1440	@1300. sunny, moderate haze; light breeze, high 90s; industrial smell
HRM3		06 August 19 0600	0090	360	sumny, moderate haze, can't see downtown very well from surrounding highways, very light breeze, mid 90s, smell doesn't seem quite as bad
HRM3	8	August 19 1215	1215	360	surny, moderate to heavy haze; light to moderate breeze; high 90s
HRM3	8	Sept. 2 0600	0090	360	unknown
HRM3	න	Sept. 5 0600	0090	360	sunny, light to moderate haze, very light breeze, mid to high 90s
HRM3	₽	Sept. 5 1215	1215	360	sunny, moderale haze, light breeze; high 90s to low 100s
HRM3	Ξ	Sept. 6 0000	0000	1440	unknown-heavy haze I'm told from forest fire activity to the northeast
HRM3	12	Sept. 7	0090	360	sumny, moderate haze, light breeze; high 80s to low 90s
HRM3	12	Sept. 7	0090	360	sunny, moderate haze, light breeze; high 80s to low 90s
HRM3	2	Sept. 7 0600	0090	360	sunny, moderate haze, light breeze, high 80s to low 90s
HRM3	2	Sept. 7	0090	360	sunny, moderate haze, light breeze, high 80s to low 90s
HRM3	13	Sept. 7 1215	1215	360	mostly clear, moderate winds from the northeast, mid 90s
HRM3 14		Sept. 8 0012	9012	1427	mostly cloudy, high 80s, light showers after 2000, southeasterly maritime flow
HRM3	15	HRM3 15 Sept. 12 0600	090	360	party cloudy, light haze, very light breeze, low to mid 90s, not much smell for this site

VI.2.1 PM Sample Collection Information

SITE	*	DATE	TIME	DURATION	SITE ID # DATE TIME DURATION ENVIRONMENTAL CONDITIONS DURING SAMPLING
HRM3	15	Sept. 12	0090	360	HRM3 15 Sept. 12 0600 360 partly cloudy, light haze, very light breeze, low to mid 90s, not much smell for this site
HRIM3	15	Sept. 12	0000	360	HRM3 15 Sept. 12 0600 360 partly cloudy, light haze, very light breeze, low to mid 90s, not much smell for this site
HRM3	15	Sept. 12	000	360	HRM3 15 Sept. 12 0600 380 partly cloudy, light haze, very light breeze, low to mid 90s; not much smell for this site
HRM3	8	Sept. 13	0000	1440	HRM3 16 Sept. 13 0000 1440 unknown—however, thunderstorms passed through the area all day

VI.2.2 PM Preliminary Results

SITE	ID#	DATE	TIME	DURATION		ос	OC err	EC	EC err	Total	TC err	EC/TC ratio
				(min)		(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	
Aldine	01	August 8	0600	360		6.26	0.51	1.86	0.29	8.11	0.71	0.23
Aldine	02	August 9	0000	1440		17.30	1.06	5.67	0.48	22.97	1.45	0.25
Aldine	03	August 10	0600	360		6.90	0.55	2.94	0.35	9.84	0.79	0.30
Aldine	04	August 10	1220	~300		6.59	0.53	0.87	0.24	7.47	0.67	0.12
Aldine	04	August 10	1220	~300	Duplicate	6.65	0.53	0.89	0.24	7.53	0.68	0.12
Aldine	05	August 11	0000	1440		15.06	0.95	2.17	0.31	17.23	1.16	0.13
Aldine	06	August 12	0600	360		9.71	0.69	1.16	0.26	10.87	0.84	0.11
Aldine	07	August 12	1215	360		8.32	0.62	0.50	0.22	8.82	0.74	0.06
Aldine	07	August 12	1215	360	Duplicate	8.57	0.63	0.42	0.22	8.99	0.75	0.05
Aldine	08	August 13	0000	1440		42.20	2.31	2.63	0.33	44.83	2.54	0.06
Aldine	08	August 13	0000	1440	Duplicate	41.23	2.26	2.75	0.34	43.98	2.50	0.06
Aldine	09	August 14	0600	360		9.91	0.70	1.57	0.28	11.48	0.87	0.14
Aldine	11	August 14	1820	330		4.77	0.44	0.68	0.23	5.45	0.57	0.12
Aldine	12	August 15	0015	1425		14.98	0.95	5.72	0.49	20.71	1.34	0.28
Aldine	13	August 16	0600	360		5.05	0.45	1.62	0.28	6.67	0.63	0.24
Aldine	14	August 16	1215	360		6.84	0.54	0.66	0.23	7.50	0.67	0.09
Aldine	15	August 17	0000	1440		19.55	1.18	2.22	0.31	21.76	1.39	0.10
Aldine	16	August 18	0600	360		6.56	0.53	1.88	0.29	8.44	0.72	0.22
Aldine	17	August 18	1215	360		11.37	0.77	1.07	0.25	12.44	0.92	0.09
Aldine	18	August 19	0000	1440		26.97	1.55	2.44	0.32	29.41	1.77	0.08
Aldine	19	August 20	0600	360		6.54	0.53	1.13	0.26	7.67	0.68	0.15
Aldine	20	August 20	1215	360		7.98	0.60	0.47	0.22	8.45	0.72	0.06
Aldine	21	August 20	1830	330		4.43	0.42	0.67	0.23	5.10	0.56	0.13
Aldine	22	August 21	0020	1420		19.96	1.20	2.46	0.32	22.42	1.42	0.11
Aldine	23	August 22	0600	360		7.67	0.58	2.01	0.30	9.68	0.78	0.21
Aldine	24	August 22	1215	360		6.49	0.52	0.73	0.24	7.21	0.66	0.10
Aldine	25	August 23	0000	1440		27.41	1.57	3.26	0.36	30.68	1.83	0.11
Aldine	26	August 24	0600	360		7.76	0.59	1.95	0.30	9.72	0.79	0.20
Aldine	27	August 24	1215	360		5.62	0.48	1.18	0.26	6.80	0.64	0.17
Aldine	28	August 25	0000	1440		18.53	1.13	3.89	0.39	22.42	1.42	0.17
Aldine	29	August 26	0600	360		4.39	0.42	1.22	0.26	5.61	0.58	0.22
Aldine	30	August 26	1215	360		6.55	0.53	0.75	0.24	7.30	0.66	0.10
Aldine	31	August 26	1830	330		3.34	0.37	0.38	0.22	3.72	0.49	0.10
Aldine	32	August 27	0015	1425		8.63	0.63	1.66	0.28	10.29	0.81	0.16
Aldine	33	August 28	0600	360		4.87	0.44	1.80	0.29	6.67	0.63	0.27
Aldine	34	August 28	1215	360		6.73	0.54	0.77	0.24	7.50	0.68	0.10
Aldine	34	August 28	1215	360	Duplicate	6.74	0.54	0.78	0.24	7.53	0.68	0.10
Aldine	35	August 29	0000	1440		15.06	0.95	2.24	0.31	17.31	1.17	0.13
Aldine	36	August 30	0600	360		3.71	0.39	0.91	0.25	4.62	0.53	0.20
Aldine	36	August 30	0600	360	Duplicate	3.70	0.39	0.93	0.25	4.63	0.53	0.20
Aldine	37	August 30	1215	360		6.58	0.53	0.55	0.23	7.13	0.66	0.08

VI.2.2 PM Preliminary Results

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SITE	1D#	DATE	TIME	DURATION		ос	OC err	EC	EC err	Total	TC err	EC/TC ratio
-				(min)		(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	
Aldine	38	August 31	0000	720		8.52	0.63	1.32	0.27	9.84	0.79	0.13
Conroe	01	August 8	0600	360		6.94	0.55	0.69	0.23	7.63	0.68	0.09
Conroe	02	August 8	1215	360		6.96	0.55	0.58	0.23	7.54	0.68	0.08
Conroe	03	August 9	0000	1440		18.42	1.12	3.20	0.36	21.62	1.38	0.15
Conroe	04	August 11	0600	360		4.07	0.40	0.33	0.22	4.40	0.52	0.07
Conroe	05	August 11	1250	360		8.75	0.64	0.30	0.21	9.04	0.75	0.03
Conroe	05	August 11	1250	360	Duplicate	8.71	0.64	0.23	0.21	8.94	0.75	0.03
Conroe	06	August 13	0600	360		12.69	0.83	0.58	0.23	13.27	0.96	0.04
Conroe	07	August 13	1215	360		10.60	0.73	0.34	0.22	10.94	0.85	0.03
Conroe	08	August 27	0600	360		4.81	0.44	0.53	0.23	5.34	0.57	0.10
Conroe	09	August 27	1215	360		6.89	0.54	0.35	0.22	7.24	0.66	0.05
Conroe	10	August 29	0600	360		4.81	0.44	0.96	0.25	5.77	0.59	0.17
Conroe	11	August 30	0000	1440		15.43	0.97	1.27	0.26	16.71	1.14	0.08
Conroe	12	August 31	0600	360		6.44	0.52	0.87	0.24	7.30	0.67	0.12
Conroe	12	August 31	0600	360	Duplicate	6.69	0.53	0.89	0.24	7.58	0.68	0.12
Galvest	01	August 20	0000	1440		9.27	0.66	0.99	0.25	10.25	0.81	0.10
Galvest	02	August 21	0600	360		3.66	0.38	0.40	0.22	4.06	0.50	0.10
Galvest	03	August 21	1215	360		4.66	0.43	0.54	0.23	5.20	0.56	0.10
Galvest	03	August 21	1215	360	Duplicate	4.75	0.44	0.60	0.23	5.35	0.57	0.11
Galvest	04	August 22	0000	1440		15.13	0.96	1.50	0.27	16.62	1.13	0.09
Galvest	05	August 23	0600	360		3.70	0.39	0.55	0.23	4.25	0.51	0.13
Galvest	06	August 23	1215	360		4.69	0.43	0.67	0.23	5.36	0.57	0.13
Galvest	07	August 24	0000	1440		5.96	0.50	0.79	0.24	6.75	0.64	0.12
Galvest	08	August 25	0600	360		3.86	0.39	0.78	0.24	4.64	0.53	0.17
HRM3	01	August 15	0600	360		5.00	0.45	1.85	0.29	6.85	0.64	0.27
HRM3	02	August 15	1215	360		6.22	0.51	0.91	0.25	7.14	0.66	0.13
HRM3	03	August 17	0600	360		1.07	0.25	0.01	0.20	1.07	0.35	0.01
HRM3	04	August 17	1215	360		10.84	0.74	1.07	0.25	11.91	0.90	0.09
HRM3	04	August 17	1215	360	Duplicate	10.50	0.72	1.07	0.25	11.57	0.88	0.09
HRM3	05	August 18	0000	1440		24.21	1.41	4.09	0.40	28.29	1.71	0.14
HRM3	06	August 19	0600	360		11.95	0.80	1.50	0.28	13.45	0.97	0.11
HRM3	07	August 19	1215	360		10.77	0.74	0.75	0.24	11.52	0.88	0.07
HRM3	08	Sept. 2	0600	360		6.09	0.50	0.80	0.24	6.89	0.64	0.12
HRM3	09	Sept. 5	0600	360		10.24	0.71	2.74	0.34	12.98	0.95	0.21
HRM3	10	Sept. 5	1215	360		12.21	0.81	1.31	0.27	13.52	0.98	0.10
HRM3	11	Sept. 6	0000	1440		45.59	2.48	4.02	0.40	49.61	2.78	0.08
HRM3	12	Sept. 7	0600	360		4.89	0.44	0.90	0.25	5.80	0.59	0.16
HRM3	12	Sept. 7	0600	360	Duplicate	4.74	0.44	0.96	0.25	5.70	0.59	0.17

VI.2.2 PM Preliminary Results

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SITE	ID#	DATE	TIME	DURATION		oc	OC err	EC	EC err	Total	TC err	EC/TC ratio
				(min)		(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ug/cm2)	
HRM3	12	Sept. 7	0600	360	Backup	1.11	0.26	0.00	0.20	1.12	0.36	0.00
HRM3	12	Sept. 7	0600	360	Backup Dup:	1.03	0.25	-0.02	0.20	1.01	0.35	-0.02
HRM3	13	Sept. 7	1215	360		20.99	1.25	1.24	0.26	22.23	1.41	0.06
HRM3	14	Sept. 8	0012	1427		16.85	1.04	1.62	0.28	18.46	1.22	0.09
HRM3	15	Sept. 12	0600	360		4.61	0.43	0.96	0.25	5.57	0.58	0.17
HRM3	15	Sept. 12	0600	360	Duplicate	4.48	0.42	1.16	0.26	5.65	0.58	0.21
HRM3	15	Sept. 12	0600	360	Backup	1.01	0.25	0.03	0.20	1.04	0.35	0.03
HRM3	15	Sept. 12	0600	360	Backup Dup.	0.99	0.25	0.02	0.20	1.01	0.35	0.02
HRM3	16	Sept. 13	0000	1440		15.98	1.00	3.95	0.40	19.93	1.30	0.20

- VI.3 TNRCC DATA--ALDINE
- VI.3.1 Temperature Data (°F)--Aldine
- VI.3.2 Wind Speed Data (mph)--Aldine
- VI.3.3 Wind Direction (0-359 degrees)-Aldine
- VI.3.4 Ozone (ppb)--Aldine

VI.3.1 Temperature Data (°F)--Aldine

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775 784 785 784 785 784 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 785 <th>9</th> <th>78.8</th> <th>79.6</th> <th>79.2</th> <th>75.3</th> <th>79.2</th> <th>77.2</th> <th>79.9</th> <th>75.8</th> <th>80.1</th> <th>77.8</th> <th>79.8</th> <th>78</th> <th>7.77</th> <th>76.1</th> <th></th> <th>73</th> <th>78.1</th> <th>76.6</th>	9	78.8	79.6	79.2	75.3	79.2	77.2	79.9	75.8	80.1	77.8	79.8	78	7.77	76.1		73	78.1	76.6
752 78 762 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 7	9		78.4	78	75.7	9.82	77.2	9'82	75.4	79.6	8.77	78.7	11	9.92	75.4			77.6	7.97
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75.7 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 78.5 <th< th=""><th></th><th>76.7</th><th>78.2</th><th>76</th><th>74.5</th><th>77.5</th><th>75.6</th><th>76.7</th><th>75.9</th><th>79.2</th><th>75.7</th><th>77.6</th><th>75.4</th><th>74.3</th><th>73.8</th><th>1.77</th><th>78.1</th><th>76.1</th><th>75.8</th></th<>		76.7	78.2	76	74.5	77.5	75.6	76.7	75.9	79.2	75.7	77.6	75.4	74.3	73.8	1.77	78.1	76.1	75.8
76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 76.5 <th< th=""><th>0</th><th>75.7</th><th>78.5</th><th>75.8</th><th>73.9</th><th>6.92</th><th>75.3</th><th>75.5</th><th>75.2</th><th>78.6</th><th>75.9</th><th>11</th><th>7.47</th><th>74</th><th>73.2</th><th>78.7</th><th>77.77</th><th>75.6</th><th>75.4</th></th<>	0	75.7	78.5	75.8	73.9	6.92	75.3	75.5	75.2	78.6	75.9	11	7.47	74	73.2	78.7	77.77	75.6	75.4
84.2 85.3 81.1 78.1 78.5 78.5 80.2 80.2 79.7 79.9 78.8 77.8 78.9 77.8 78.9 77.8 78.9 78.7 78.9 78.7 78.9 87.1 88.9 88.7 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 88.2 <th< th=""><th>9</th><th>76.9</th><th>79.5</th><th>76.7</th><th>74.7</th><th>77.2</th><th>75.9</th><th>75.6</th><th>76.5</th><th>79.4</th><th>76.8</th><th>77.3</th><th>75.3</th><th>73.7</th><th>74</th><th>77.2</th><th></th><th>75</th><th>75.9</th></th<>	9	76.9	79.5	76.7	74.7	77.2	75.9	75.6	76.5	79.4	76.8	77.3	75.3	73.7	74	77.2		75	75.9
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65.6 67.5 68.5 68.4 68.5 68.7 68.7 68.5 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 68.7 <th< th=""><th>800</th><th>84.2</th><th>85.3</th><th>83.8</th><th>81.2</th><th></th><th></th><th>82.8</th><th>84.9</th><th>85</th><th>82.6</th><th>83</th><th>82.4</th><th></th><th></th><th></th><th></th><th>81.9</th><th>82.2</th></th<>	800	84.2	85.3	83.8	81.2			82.8	84.9	85	82.6	83	82.4					81.9	82.2
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89.9 91.2 90.2 90.2 90.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 91.2 <th< th=""><th>8</th><th>88</th><th>90</th><th>98.6</th><th>87</th><th>88</th><th></th><th>90.5</th><th>89.3</th><th>89.1</th><th></th><th>988.6</th><th>1.78</th><th>87.8</th><th>87.3</th><th>88.1</th><th>86.5</th><th>82.2</th><th>8.98</th></th<>	8	88	90	98.6	87	88		90.5	89.3	89.1		988.6	1.78	87.8	87.3	88.1	86.5	82.2	8.98
89.7 85.8 92.7 91.5 92.7 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 <th< th=""><th>8</th><th>89.9</th><th>91.2</th><th>90.2</th><th>93.6</th><th>80.8</th><th>90.2</th><th>93.2</th><th>ъ</th><th>89.5</th><th>93.6</th><th></th><th>90.2</th><th>90</th><th>96</th><th></th><th>83.8</th><th>79.4</th><th>89.1</th></th<>	8	89.9	91.2	90.2	93.6	80.8	90.2	93.2	ъ	89.5	93.6		90.2	90	96		83.8	79.4	89.1
91.7 82.5 93.3 93.4 94.4 94.5 96.7 96.3 96.5 96.5 96.7 96.7 96.5 96.5 96.7 96.5 96.5 96.7 96.7 96.5 96.5 96.7 96.5 96.5 96.5 96.7 96.5 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.5 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 <th< th=""><th>8</th><th>89.7</th><th>85.8</th><th>92.7</th><th></th><th>92.7</th><th>92.8</th><th>98</th><th></th><th>90.2</th><th></th><th>94.5</th><th>97.6</th><th>92.3</th><th>92.1</th><th>93.4</th><th></th><th>80.8</th><th>91.2</th></th<>	8	89.7	85.8	92.7		92.7	92.8	98		90.2		94.5	97.6	92.3	92.1	93.4		80.8	91.2
91.7 80.8 92.9 94.7 96.9 95.6 96.7 95.7 96.7 95.6 95.2 95.7 96.3 96.7 96.8 96.7 96.9 96.7 96.7 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.7 96.8 96.7 96.8 96.7 96.8 96.7 96.9 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 <th< th=""><th>8</th><th>91.1</th><th>82.5</th><th>93.3</th><th>93.4</th><th>94.4</th><th>94.5</th><th>96.7</th><th>92.3</th><th></th><th>94</th><th>96.3</th><th>94.5</th><th>94</th><th>94.2</th><th>95.1</th><th></th><th>82.6</th><th>90.2</th></th<>	8	91.1	82.5	93.3	93.4	94.4	94.5	96.7	92.3		94	96.3	94.5	94	94.2	95.1		82.6	90.2
91.8 61.4 91.6 96.5 91.6 93.2 97.1 96.8 96.7 96.8 97.2 97.2 97.6 96.7 96.8 96.7 96.8 97.7 96.8 97.2 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 97.8 <th< th=""><th>8</th><th>91.7</th><th>80.8</th><th>92.9</th><th>94.7</th><th>96</th><th>92.6</th><th>296</th><th>92.4</th><th>92.7</th><th>95.9</th><th>96.5</th><th>95.7</th><th>92.6</th><th>95.2</th><th>95.4</th><th>83.7</th><th>82</th><th>78.9</th></th<>	8	91.7	80.8	92.9	94.7	96	92.6	296	92.4	92.7	95.9	96.5	95.7	92.6	95.2	95.4	83.7	82	78.9
91.2 82.5 91.4 95.5 91.2 95.4 95.5 91.2 95.4 95.7 95.2 94.4 95.2 94.4 95.2 94.4 95.2 94.4 95.2 94.3 95.2 94.3 95.2 94.3 95.2 94.3 95.2 94.3 95.2 94.3 95.2 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 94.3 97.5 97.5 94.3 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 <th< th=""><th>8</th><th>94.8</th><th></th><th>91.6</th><th>96.1</th><th>97.5</th><th>8.96</th><th>36.5</th><th></th><th>93.2</th><th>97.1</th><th>8.96</th><th>96.7</th><th>96.3</th><th>9.96</th><th>96.4</th><th>85.9</th><th>84.7</th><th>77.2</th></th<>	8	94.8		91.6	96.1	97.5	8.96	36.5		93.2	97.1	8.96	96.7	96.3	9.96	96.4	85.9	84.7	77.2
90.3 83.7 90.8 94.5 97.5 96.2 94.3 96.2 97.5 96.2 94.3 97.5 97.5 97.5 97.5 97.5 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 97.7 <th< th=""><th>8</th><th></th><th>82.6</th><th></th><th>9.96</th><th>1.76</th><th>99.9</th><th>95.5</th><th></th><th>93.4</th><th>97.6</th><th>2.96</th><th>96.2</th><th>94.4</th><th>96.3</th><th>95.7</th><th></th><th>85.1</th><th>77.9</th></th<>	8		82.6		9.96	1.76	99.9	95.5		93.4	97.6	2.96	96.2	94.4	96.3	95.7		85.1	77.9
86.4 83.5 86.6 92.3 84.7 90.7 90.2 90.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 91.7 <th< th=""><th>8</th><th>90.3</th><th>83.7</th><th>80.9</th><th>94.5</th><th>97</th><th>8</th><th>93.3</th><th>89.9</th><th></th><th></th><th>95.2</th><th>94.3</th><th>92.8</th><th>93.3</th><th>93.5</th><th>88.5</th><th>84.5</th><th>77.7</th></th<>	8	90.3	83.7	80.9	94.5	97	8	93.3	89.9			95.2	94.3	92.8	93.3	93.5	88.5	84.5	77.7
83.1 85.2 86.3 91.2 86.3 86.3 89.1 89.5 87.8 86.5 87.7 86.3 89.1 89.5 87.8 86.5 87.7 84.8 87.1 89.5 87.2 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 <th< th=""><th>800</th><th>88.</th><th>83.9</th><th>98.6</th><th>92.3</th><th>84.8</th><th>94.1</th><th>90.1</th><th>87.7</th><th>89.2</th><th>93.2</th><th>92.7</th><th></th><th>90</th><th></th><th></th><th></th><th>83.7</th><th>17.77</th></th<>	800	88.	83.9	98.6	92.3	84.8	94.1	90.1	87.7	89.2	93.2	92.7		90				83.7	17.77
84.1 82.2 82.6 86.1 81.2 88.1 84.5 84.5 87.1 85.9 85.1 83.5 84.5 84.8 83.2 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 <th< th=""><th>8</th><th>85.4</th><th>83.1</th><th>85.2</th><th>88.8</th><th>82.9</th><th></th><th></th><th>85.7</th><th>86.3</th><th>89.1</th><th>89.5</th><th></th><th></th><th>87</th><th>2.98</th><th>84.8</th><th>82.5</th><th>77.6</th></th<>	8	85.4	83.1	85.2	88.8	82.9			85.7	86.3	89.1	89.5			87	2.98	84.8	82.5	77.6
83.1 81.4 81.3 84.3 80.4 82.4 83.8 82.2 83.2 83.5 81.5 81.9 82.9 83.8 80.4 83.7 80.4 81.5 84.9 82.4 80.8 80.4 81.8 82.4 80.8 80.4 81.8 82.6 80.5 73.1 81 80.7 78.2 81.3 79 82.7 81.1 79.8 83 80.9 80.1 78.7 81 81 78.7 81 78.5 77.9	8	84.1	82.2	82.6	98.1		88.		84.3	84.4	87.1	85.9	85.1	83.5	84.5	84.8	83.2		76.9
82 80.9 79.6 83 80.4 83.7 80.5 82.4 81.5 84.9 82.4 80.8 80.4 81.8 80.6 82.9 80.1 78.7 81.8 83.7 81.1 79.8 83 80.9 80.1 78.7 81 73.5 77.9	8	83.1			84.3	80.1	86.1	82.4	83.8	82.8		83.6	82.5		82.9	83.8			76.3
81 80.7 78.2 81.3 79 82.2 77.5 81.1 79.8 83 80.9 80.1 78.7 81 81 79.5 77.9	8	85		79.6	8		83.7	80.5	82.4		84.9	82.4		80.4		82.6		79.1	7.6
	8	8	80.7	78.2	81.3	25	82.2	77.5	<u>~</u>	79.8	æ	80.9	80.1	78.7	85	₩	79.5	6.77	75.4

VI.3.1 Temperature Data (°F)—Aldine

. 1	4-12 gun-02	27-Aug 28	28-Aug 2	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
		+															
200	200	~	79.5	£	79.7	83.7	85.9	77.4	84.4	85.3	83.4	85.7	79.5	74.2	75.8	77.8	78.3
77.1	77.5	_	78.5	77.6	78.4	82.4	84.2	8.77	83.3	83.2	81.4	1.28	79	73.7	75.6	77.3	77.8
76.1	75.9		78.1	76.5	77.6	80.9	83.1	8.77	81.9	81.1	80.5	80.2	78.2	72.8	75.7	77	11
75.7	75.	2	77	75.3	76.9	79.3	81.8	6.77	81.1	80.4	80.1	17.7	76.7	72.4	75.7	76.5	76.6
74.3	74	6	76.2	74.9	76.2	79	81	77.6	80.2	80.8	79	75.7	76	22	75.8	76.4	76.8
74.3	74	8	6.57	74.8	7.97	77.7	80.7	77.6	79.2	79.4	78.8	74.3	75.1	72.3	75.6	76.4	76.2
	74.3 75.	4	76.4	75.9	77.2	78.1	90.6	78.8	78.9	78.7	78.9	73.3	74.3	72.5	75.2	76.1	77.3
20	.8 79	2	80.2	79.5	79.2	81.4	83.2	82.4	81.6	81.9	83.8	74	76.6	73.1	76.1	79.7	80.2
20	7 83.	4	83.9	83.2	82.2	98	85.9	84.9	84.5	87.2	87.8	76.3	79.3	74.2	77.3	83.4	83.5
	85.3 86		87.3	86.4	85.3	90.4	93.6	87.7	88.4	92.9	92.1	79.5	84	9'92	80.2	84.5	83.8
	87.7 88.	6	89.1	89.2	88.3	94.6	93	90.6	92	97.6	96.4	82.9	83.2	79.2	82.5	87.4	84.1
	90 91		91.2	91	91.8	98.7	97	94.3	95.7	101.3	100.3	86.3	9.98	18	85.1	89.3	85.9
	92.1 92.		93.4	93.6	95	101.2	100.1	97.1	98.4	104.7	102.6	89.1	89.2	82.5	86.4	91.6	85.7
ଞ	.3 93.9		95.1	95.7	98.1	102.5	102.1	98.9	100.3	106.4	104.2	90.8	91	85.4	85.4	87.8	85.5
-6	94.6 92.	6	95.3	96.9	100.2	103.9	103.7	100.6	101.9	106.8	104.6	92.2	91.5	£. 2 8	86.1	86.9	83.7
8	2 92		94.7	98.2	101.3	104.5	104.1	101.6	102.8	106.4	104	93.2	91.1	85.5	88.4	87.6	88.2
ന	93.2 92.8		94.3	87.8	102.1	104.7	96.3	102.1	103.2	105.9	102	93.8	89.9	92	87.4	79.6	88
क	7.	ωi	92.7	94.5	101.4	103.3	8	95.2	102.8	103.8	101.3	93	87.8	83.4	85.8	81.8	88.4
8	.3	5	89.7	8	88	99.9	81.5	92.4	98.7	99.7	100	90.7	83.8	81.1	83.3	82.8	86.4
8	3 85	6	86.5	87.7	92.7	92.6	85	91.2	96.3	96.3	96.9	88.1	81	62	81.2	82.6	83.9
8	88	6	84	85.2	89.5	93.6	82.7	9.88	92.7	8	94.2	84.9	78.8	78.4	79.9	81.7	82.4
ळ	.8	8	82.5	83.5	88.1	91.8	81.7	9.98	90.7	80.8	92.1	84.3	77.1	76.5	79.6	80.4	81.2
8	6. 20		81.3	82.1	86.4	90.7	79.9	86.3	87	88	89.9	83.2	75.7	75.8	78.8	79.5	79.8
	79.7	9	80.2	84	85.4	87.9	78.1	85.7	9.98	82.8	88.3	81.3	74.7	76.1	78.5	78.6	8.87

VI.3.1 Temperature Data (°F)—Aldine

100 77.6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	75.2 75.6 75.2 75.2 75.3	77.4			
77.6 76.6 77 77.7 77.3 77.3 77.8 80.5 83.7 83.7 86 87.6 89.1 89.1	75.2 75.8 75.2 75.2 75.2 75.3	77.4			
76.8 77 77.7 77.3 77.3 77.8 80.5 86.8 86.8 89.1 89.1 89.1 90.5	75.6 75.2 75.2 75.2 75.3	8.92	74.3	75	65.6
76.6 77 76.7 77.3 77.8 80.5 83.7 86 87.6 89.1 89.1 90.5	75.2		73.9	72.5	65.2
77. 76.7 77.3 77.8 80.5 83.7 86 86 87.6 89.1 90.5	75.2	76.2	74	71.1	63.8
76.7 77.3 77.8 80.5 88.7 86 87.6 89.1 90.5	75.2	75.5	74.2	70.6	62.5
77.3 80.5 83.7 86 87.6 89.1 90.5	75.3	75.1	74	67.4	61.4
80.5 83.7 86 86 87.6 89.1 90.5	5.3	74.8	73.9	66.4	61
80.5 83.7 86 87.6 89.1 90.5		74.8	73.9	62.9	6.09
86. 87.6 89.1 90.5 91.4	75.3	76.1	76	2.78	63.8
86 87.6 89.1 90.5 91.4	75.7	79.3	79.5	7.1	69.1
87.6 89.1 90.5	92	82.7	82.5	73.6	73.7
90.5	7.97	86.2	83.3	77.4	77.4
90.5	76.4	87.4	85.3	80.4	80
91.4	74.8	86.4	88.8	82.6	81.6
	74.5	80.9	90.9	84.6	83.9
1400 87.1	8.92	83.3	80.8	86.7	85.2
1500 90.3 (9.08	98	91.5	97.8	86.5
1 600 89.9	80.2	85.8	91.7	87.8	87.1
1700 88.1	79.5	80.3	90.8	9.98	86.3
1800 85.6	78.2	77	88.6	82	80.8
1900 82.9	9.77	77.2	85.8	7.97	74.8
2000 75.8	9.77	76.9	83.3	73.1	71.1
2100 75.5	5.77	76.2	81.3	8.69	68.2
2200 75.7	77.7	75.5	79.9	68.2	9.99
2300 75.7	97.7	74.6	77.4	2.59	63.9

VI.3.2 Wind Speed Data (mph)—Aldine

18 32 22 3 14 14 25 45 17 29 25 14 23 38 07 24 13 15 08 4.1 15 1 07 08 05 52 1 22 07 1.1 02 4.7 0.5 0.9 0.6 1.2 04 4.7 0.5 0.9 0.6 1.2 17 8 2.8 1.4 0.3 2.2 17 8 2.8 1.4 0.3 2.2 51 8.6 4.2 3.4 2.7 4.4 47 5.2 1.4 0.3 2.7 1.4 47 5.2 1.4 2 5.5 1.5 54 4.7 5.2 1.4 2 5.5 1.5 55 2.3 2.7 3.4 2.7 5.7 43 2.6 4.4 4.3 4.2 7.6 43 2.6 4.4 4.3 4.2 7.6 43 2.7 3.4 8.8 8.3 43 4.7 5.3 4.6 4.6		07-Aug	07-Aug 08-Aug 09-Aug 10-Aug 11-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	13-Aug 14-Aug 15-Aug 16-Aug 17-Aug 18-Aug	18-Aug	19-Aug 20-Aug 21-Aug	20-Aug	21-Aug	22-Aug 23-Aug	23-Aug	24-Aug
31 15 34 13 35 23 16 05 17 18 32 22 37 14 19 06 03 13 25 45 17 29 25 14 06 15 1 24 15 41 09 06 03 13 25 45 17 29 25 14 05 12 04 16 48 1 01 21 08 03 05 13 17 29 25 14 10 08 08 13 17 02 07 24 13 05 08 06 13 17 02 09 06 13 17 02 14 10 08 13 17 02 14 41 13 13 05 14 17 12 05 14 41 14 14 16 14 14 14 14	TIME																		
15 1 24 15 41 09 08 03 13 25 45 17 29 25 14 05 22 04 16 43 1 09 08 03 23 38 07 24 13 15 99 13 12 09 05 48 1 01 21 05 68 41 15 1 07 08 09 09 09 05 14 15 1 07 04 1 01 13 05 68 13 05 67 1 07 04 1 1 1 1 1 1 05 08 05 1 1 05 08 1 1 05 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	•	3.1	1.5	3.4	1.3	3.5	2.3	1.6	0.5	1.7	1.8	3.2	2.2	3	1.4	1.4	9.0	2	1.2
22 04 04 16 43 1 09 08 03 23 38 07 24 13 15 14 15 14 15 14 15 14 15 14 16 48 1 11 15 1 07 08 08 13 05 41 15 1 07 08 09 08 13 13 05 05 14 10 07 04 3 08 06 13 13 05 14 10 13 13 05 05 06 14 10 13 13 05 06 14 10 14 08 14 10 14 08 14 17 17 14 11 17 14 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11	5	1.5	-	2.4	1.5	4.1	6.0	9.0	0.3	1.3	2.5	4.5	1.7	2.9	2.5	1.4	0.5	2.5	6.0
13 12 0.9 0.5 4.8 1 0.1 2.1 0.6 0.8 4.1 1.5 1 0.7 0.8 0.1 1.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.7 1.1 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 1.1 1.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	200	2.2	0.4	9.0		4.3	-	6.0	9.0	0.3	2.3	3.8	7.0	2.4	1.3	1.5	6.0	2.3	1.5
14 2 07 16 49 08 16 13 13 65 52 1 22 07 11 12 05 31 07 04 3 08 06 19 17 02 47 05 09 06 11 17 02 47 05 09 06 11 17 02 47 05 09 06 11 17 02 47 05 09 06 13 17 06 07 14 41 08 28 2 08 06 18 2 08 06 18 2 08 14 41 18 44 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41	8	1.3	1.2	6.0	0.5	4.8	-	0.1	2.1	9.0	9.0	4.1	1.5	1	0.7	0.8	0.4	3.9	2.1
05 31 07 04 3 08 06 19 17 02 47 05 08 12 17 17 08 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 20 40 52 05 05 05 07 14 41 19 22 20 19 28 28 14 60 32 23 42 42 47 61 80 42 47 48 51 88 28 42 47 48 51 88 37 44 47 47 61 89 49 41 48 51 48 51 48 51 48 51 48 51 48 51 48 51 48 51 48 51 48 51 48 51 48 </th <th>\$</th> <th>1.4</th> <th>2</th> <th>0.7</th> <th>1.6</th> <th>4.9</th> <th>0.9</th> <th>9.0</th> <th>1.9</th> <th>1.3</th> <th>0.5</th> <th>5.2</th> <th>1</th> <th>2.2</th> <th>0.7</th> <th>1.1</th> <th>1.2</th> <th>3.5</th> <th>9.0</th>	\$	1.4	2	0.7	1.6	4.9	0.9	9.0	1.9	1.3	0.5	5.2	1	2.2	0.7	1.1	1.2	3.5	9.0
13 16 08 13 28 14 08 28 2 08 52 05 06 07 14 41 25 4 17 17 54 34 25 42 27 17 8 28 14 03 22 47 44 66 32 23 24 53 44 51 85 42 34 42 44 45 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 44 53 54 53 44 53 54 54 44 54 54 54 44 54 54 54	200	0.5	3.1	0.7	0.4	က	0.8	9.0	1.9	1.7	0.2	4.7	0.5	0.9	9.0	1.2	1.1	3.2	1.9
4 17 54 34 25 42 27 17 8 28 14 03 22 47 44 66 32 23 25 21 4 53 44 51 86 42 34 37 44 64 61 65 31 35 49 44 40 46 63 64 65 64 65 74 65 31 35 49 44 42 45 63 64 65 64 65 61 65 31 35 43 47 56 44 42 45 65 65 65 65 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67	009	1.3	1.6	9.0	1.9	2.8	1.4	0.8	2.8	2	9.0	5.2	0.5	9.0	0.7	1.4	4.1	2.6	9.0
44 66 32 23 75 21 4 53 44 51 86 42 34 31 42 34 44 45 74 61 65 31 35 49 44 42 45 65 63 63 64 65 74 65 14 2 35 46 47 46 47 52 14 2 55 15 46 47 47 52 14 2 55 15 46 47 52 14 2 55 15 46 47 52 14 2 55 15 46 47 52 14 47 57 56 47 57 47 57 58 47 57 58 47 57 48 57 58 47 58 48 51 48 51 48 51 48 51 58 58 51	2	2.5	4	1.7	1.7	5.4	3.4	2.5	4.2	2.7	1.7	8	2.8	1.4	0.3	2.2	4.7	2.9	1.8
46 63 44 12 68 04 45 74 6 61 65 31 35 49 44 42 45 55 53 47 53 47 52 14 2 55 15 46 47 45 45 45 45 63 67 86 7 52 23 26 27 36 67 86 7 29 2 32 47 47 47 46 47 43 47 47 47 48 47 43 47 47 47 48 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47	800	4.4	9.9	3.2	2.3	7.5	2.1	4	5.3	4.4	5.1	9.8	4.2	3.4	3.7	4.4	4.2	2.7	2.2
45 55 29 19 32 22 57 78 53 47 52 14 2 55 15 46 45 45 45 45 63 63 63 55 23 25 17 29 55 23 25 25 34 27 29 55 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 63 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 <th>900</th> <th>4.6</th> <th>6.3</th> <th>4.4</th> <th>1.2</th> <th>6.8</th> <th>0.4</th> <th>4.5</th> <th>7.4</th> <th>9</th> <th>6.1</th> <th>6.5</th> <th>3.1</th> <th>3.5</th> <th></th> <th>4.4</th> <th>4.2</th> <th>3.2</th> <th>2</th>	900	4.6	6.3	4.4	1.2	6.8	0.4	4.5	7.4	9	6.1	6.5	3.1	3.5		4.4	4.2	3.2	2
45 45 19 39 2 29 85 63 55 23 26 27 29 85 63 63 22 23 25 23 25 27 35 67 86 7 29 2 25 25 34 27 29 75 32 34 32 27 49 74 95 71 43 26 34 47 47 42 27 36 47 47 42 47 43 42 42 56 44 48 47 46 47 47 47 43 42 42 42 42 42 42 42 42 42 43 43 42 43 42 42 45 44 44 43 42 42 44 43 43 44 43 43 44 43 43 43 44 43 43 43	1000	5	5.5	2.9	1.9	3.2	2.2	5.7	7.8	5.3	4.7	5.2	1.4	2	5.5	1.5	4.6	5.2	3
59 67 3 56 7 29 7 32 25 34 27 35 67 86 7 29 2 32 25 34 37 36 37 36 37 36 37 37 36 47 37 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 48 47 48 47 48	15	4.5	4.5	1.9	3.9	2	2.9	5.9	8.5	6.3	5.5	2.3	2.6	2.3	4.7	2.7	5.6	5.9	2.6
75 32 34 32 27 49 74 95 71 43 26 44 43 26 44 43 26 44 76 76 77 43 77 42 77 76 77 36 64 77 76 77 42 77 36 64 51 67 47 47 48 31 72 42 51 31 65 67 45 57 43 43 47 67 45 45 47 43 43 42 42 43 45 43 43 42 43 43 43 43 43 43 43 43 43 43 43 43 43 43 43 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44 44<	1200	5.9	8.7	3	2.8	2.7	3.5	6.7	9.8	7	2.9	2	3.2	2.5	3.4	2.7	2.9	3.9	3.2
7.9 3.7 5 4.2 2 1.6 8.1 10.9 9.9 1.9 4.3 2.7 4.2 5.1 3.1 6.7 3.1 5.7 4.2 5.1 3.1 7.2 4.2 5.1 3.1 6.7 4.5 5.1 4.5 4.5 5.2 4.2 5.4 11.3 10.8 3.1 7.2 4.2 5.1 3.1 7.2 4.2 5.1 3.1 6.5 5.1 3.1 6.7 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	1300	7.5	3.2	3.4	3.2	2.7	4.9	7.4	9.5	7.1	4.3	2.6	4.4	4.3	4.2	7.6	2.6	3.4	6.9
8.6 3.3 7.4 0.1 3.9 4.4 7.8 11.3 10.8 3.1 7.2 4.2 5.1 3.1 6.7 4.5 4.5 4.2 11.3 8.1 7.4 8.3 8.7 5.8 8.3 8.7 5.8 8.3 8.7 5.8 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5<	1400	7.9	3.7	5	4.2	2	1.6	8.1	10.9	9.9	1.9	3.9	4.3	2.7	3.6	6.4	5.1	4.3	9.1
9.7 2.7 6.7 4.5 4.5 4.2 9.4 11.3 8.1 3.4 8.3 8.7 8.8 8.5 8.5 8.6 8.5 8.5 8.6 9.7 10. 5.9 9.1 8.8 9.1 8.6 9.2 10 5.9 8.6 2.3 7.3 5.6 11.8 4.6 7.1 10.1 5.3 5.8 6.5 7.4 8.5 9.5 10 5.9 6.9 3.3 4.7 5.8 4.6 7.1 10.1 5.3 5.8 8.5 6.5 7.4 8.5 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8	1500	8.6	3.3	7.4	0.1	3.9	4.4	7.8	11.3	10.8	3.1	7.2	4.2	5.1	3.1	6.7	4.5	5.8	5.9
88 1.3 8.5 4.4 5 88 10.5 4.3 1.8 8.9 9.1 8.8 9.2 10 5.9 86 2.3 7.3 5.6 11.8 4.6 7.1 10.1 5.3 5.8 8.5 5.7 7.4 8.5 9.5 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8	1600	9.7	2.7	6.7	4.7	4.5	4.2	9.4	11.3	8.1	3.1	7.4	8.3	8.7	5.8	8.3	6.5	6.9	4.9
86 23 73 56 11.8 46 71 10.1 53 58 65 74 85 95 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 58 <th< th=""><th>1700</th><th>8.9</th><th>1.3</th><th>8.5</th><th>5.8</th><th>4.4</th><th>5</th><th>8.8</th><th>10.5</th><th>4.3</th><th>1.8</th><th>8.9</th><th>9.1</th><th>8.8</th><th>9.2</th><th>10</th><th>5.9</th><th>6.1</th><th>2.8</th></th<>	1700	8.9	1.3	8.5	5.8	4.4	5	8.8	10.5	4.3	1.8	8.9	9.1	8.8	9.2	10	5.9	6.1	2.8
63 33 47 548 46 6 51 73 62 7 69 41 59 7 6.1 46 46 4.8 67 5 57 61 55 46 3.7 6.1 4.8 6.1 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	1800	9.8	2.3	7.3	5.6	11.8	4.6	7.1	10.1	5.3	5.8	8.5	6.5	7.4	8.5	9.5	5.8	4.8	1.8
67 5 3.6 4.8 3.8 4 4.5 4.7 6 4.9 6.2 5.7 6.1 5.5 4.6 4.7 6.1 5.9 5.7 6.1 5.5 4.6 5.7 5.1 3.4 2.1 4.9 4.5 3.4 3.1 3.7 2.1 3.1 1.5 4.8 5.5 3.9 3 4.1 1.6 2.2 1.1 4.5 0.9 4.9 2.3 1.5 4 3.3 3.7 2.5 3 1.6 2.1	1900	6.9	3.3	4.7	5.8	4.6	٠	5.1	7.3	6.2	7	6.9	4.1	5.9	7	6.1	4.6	3.5	1.1
49 45 34 31 37 21 31 15 41 61 59 36 5 51 34 21 18 53 21 44 2 2 13 25 19 48 55 39 3 41 16 22 11 45 0.9 49 23 16 0.9 3 15 4 33 37 25 3 16 21	2000	6.7	5	3.6	4.8	3.8	4	4.5	4.7	9	4.9	6.2	5.7	6.1	5.5	4.6	3.7	1.9	0.7
18 5.3 2.1 4.4 2 2 1.9 2.5 1.9 4.8 5.5 3.9 3 4.1 1.6 2.2 1.1 4.5 0.9 4.9 2.3 1.6 0.9 3 1.5 4 3.3 3.7 2.5 3 1.6 2.1	2100	4.9	4.5	3.4	3.1	3.7	2.1	3.1	1.5	4.1	6.1		3.6	5	5.1	3.4	2.1	1.1	9.0
1.1 4.5 0.9 4.9 2.3 1.6 0.9 3 1.5 4 3.3 3.7 2.5 3 1.6 2.1	2200	1.8	5.3	2.1	4.4	2	2	1.9	2.5	1.9	4.8	5.5	3.9	3	4.1	1.6	2.2	1.6	8.0
	2300	Ξ	4.5	6.0	4.9	2.3	1.6	6.0	3	1.5	4	3.3	3.7	2.5	3	1.6	2.1	0.2	0.7

VI.3.2 Wind Speed Data (mph)—Aldine

		25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep 08-Sep		09-Sep	10-Sep	11-Sep
01 2 2 26 16 4 46 15 69 36 04 76 14 6 25 26 16 48 48 36 48 48 48 20 6 48 53 36 21 15 12 18 51 14 62 22 11 68 48 53 31 18 52 25 10 62 6 56 6 50 10 12 18 21 18 52 25 30 62 6 6 50 18 6 7 11 6 50 43 21 18 52 20 6 6 50 18 20 18 6 6 6 48 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80	TIME																		
0.0 0.1 1.5 1.2 1.8 3.7 3.1 1.4 6.2 2.5 1.1 6.8 4.8 5.3 3.2 3.2 1.4 6.2 2.5 1.1 6.8 4.8 3.3 3.8 3.1 1.8 5.5 1.5 0.4 6.5 1.5 0.4 1.5 3.8 3.1 1.8 5.5 1.5 0.4 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 <th>0</th> <th>0.1</th> <th>2</th> <th>22</th> <th>2.6</th> <th>1.6</th> <th>2.4</th> <th>4</th> <th>4.6</th> <th>1.5</th> <th>6.9</th> <th>3.6</th> <th>0.4</th> <th>7.6</th> <th>1.4</th> <th>9</th> <th>5.4</th> <th>2.9</th> <th>2.2</th>	0	0.1	2	22	2.6	1.6	2.4	4	4.6	1.5	6.9	3.6	0.4	7.6	1.4	9	5.4	2.9	2.2
12 12 12 14 15 38 31 18 55 25 26 65 65 65 65 65 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67<	100	9.0	0.7	t-	1.5	1.2	1.8	5.7	3	1.4	6.2	2.2	1.1	6.8	4.8	5.3	3.6	2.1	1.3
06 1 05 1 05 28 28 21 23 28 28 29 20 45 61 62 62 63 64 7 51 16 58 69 46 45 47 51 16 58 69 04 45 47 51 16 58 69 04 48 47 51 16 58 69 04 48 47 51 64 39 04 47 51 64 39 04 48 47 51 68 68 61 67 67 67 68 68 61 67 67 67 68 68 61 67 67 67 68 68 61 68 68 61 68 68 61 68 68 69 69 69 69 69 69 69 69 69 69 69 69 69 <th>200</th> <th>1.2</th> <th>1.2</th> <th>0.2</th> <th>1.5</th> <th>0.4</th> <th>1.5</th> <th>3.8</th> <th>3.1</th> <th>1.8</th> <th>5.5</th> <th>2.5</th> <th>6.0</th> <th>6.2</th> <th>9</th> <th>5.6</th> <th>1.8</th> <th>2</th> <th>1.2</th>	200	1.2	1.2	0.2	1.5	0.4	1.5	3.8	3.1	1.8	5.5	2.5	6.0	6.2	9	5.6	1.8	2	1.2
12 04 04 06 04 36 47 51 16 56 93 04 45 39 35 27 27 27 25 07 1 05 08 48 4 31 16 36 44 31 4 36 01 56 44 31 34 64 57 4 36 17 44 31 34 64 57 4 36 67 68 68 51 28 72 68 68 51 28 72 68 68 68 68 68 72 68 68 72 68 72 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78	300	9.0	1	0.5	-	0.5	2.5	3.3	2.8	2.1	7.3	3.2	0.5	4.3	5.1	5.4	2.3	1.2	2.2
25 07 1 0.5 08 48 4 39 1.5 4 36 01 56 48 36 48 36 01 50 46 51 24 38 34 01 57 42 51 24 38 34 04 57 42 51 24 38 64 51 24 34 61 68 68 51 28 78 62 58 58 50 78 62 58 68 51 68 68 51 68 68 51 68 68 51 68 68 51 68 68 51 68 68 51 68 68 51 68 68 51 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 </th <th>400</th> <th>1.2</th> <th>0.4</th> <th>0.4</th> <th>9.0</th> <th>0.4</th> <th>3.6</th> <th>4.7</th> <th>5.1</th> <th>1.6</th> <th>5.6</th> <th>5.9</th> <th>0.4</th> <th>4.5</th> <th>3.9</th> <th>3.5</th> <th>2.7</th> <th>2.1</th> <th>1.4</th>	400	1.2	0.4	0.4	9.0	0.4	3.6	4.7	5.1	1.6	5.6	5.9	0.4	4.5	3.9	3.5	2.7	2.1	1.4
27 0.2 0.4 18 6.4 5.1 24 3.8 34 6.4 5.1 24 3.8 44 5.1 24 3.8 44 5.1 24 3.8 44 5.1 27 6.8 6.8 5.1 28 7.8 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 5.6 5.2 3.9 7.1 6.5 6.6 7.2 3.9 7.1 6.6 7.2 3.9 7.1 6.6 7.2 3.9 7.1 6.7 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 <t< th=""><th>200</th><th>2.5</th><th>0.7</th><th>1</th><th>0.5</th><th>0.8</th><th>4.8</th><th>4</th><th>3.9</th><th>1.5</th><th>4</th><th>3.6</th><th>0.1</th><th>5.6</th><th>4.4</th><th>3.6</th><th>3.4</th><th>1.1</th><th>1.7</th></t<>	200	2.5	0.7	1	0.5	0.8	4.8	4	3.9	1.5	4	3.6	0.1	5.6	4.4	3.6	3.4	1.1	1.7
32 08 17 1 72 57 7 68 68 51 28 78 52 58 52 52 58 52 34 6 52 56 58 57 78 62 34 6 79 68 57 78 62 34 6 79 68 67 34 67 79 68 72 34 67 78 67 70 34 67 79 68 72 34 67 79 68 68 68 68 68 68 68 68 68 68 68 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	009	2.7	0.2	0.4	1.8	9.0	4.5	4.4	5.1	2.4	3.8	3.4	0.4	5.7	4.2	5.1	3.3	9.0	1.9
24 33 26 14 26 83 84 87 78 62 34 86 79 87 17 62 34 87 78 62 34 87 78 68 68 79 68 77 79 68 79 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70<	700	3.2	0.9	0.8	1.7	1	7.2	5.7	7	6.8	6.8	5.1	2.8	7.8	5.2	5.6	2.5	2.6	1.8
15 22 33 41 5 73 64 96 82 93 72 39 71 65 6 98 24 98 72 86 66 29 67 66 29 66 66 29 66 66 29 66 66 29 66 66 29 66 66 29 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 <th>900</th> <th>2.4</th> <th>3.3</th> <th>2.6</th> <th>1.4</th> <th>2.6</th> <th>8.3</th> <th>8.1</th> <th>8.4</th> <th>8.7</th> <th>7.8</th> <th>6.2</th> <th>3.4</th> <th>8</th> <th>7.9</th> <th>6.8</th> <th>2</th> <th>1.9</th> <th>2.1</th>	900	2.4	3.3	2.6	1.4	2.6	8.3	8.1	8.4	8.7	7.8	6.2	3.4	8	7.9	6.8	2	1.9	2.1
26 24 45 43 39 64 63 89 72 86 66 29 66 75 61 72 61 83 62 43 61 61 72 61 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72 72<	900	1.2	2.2	3.3	4.1	5	7.3		9.6	8.2	9.9	7.2	3.9	7.1	6.5	9	9.0	2.4	2.8
16 31 51 35 32 5 61 83 61 83 61 61 61 72 71 72 27 77 72 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 </th <th>1000</th> <th>2.6</th> <th>2</th> <th>4.5</th> <th>4.3</th> <th>3.9</th> <th>6.4</th> <th>6.3</th> <th>8.9</th> <th>7.2</th> <th>9.8</th> <th>9.9</th> <th>2.9</th> <th>9.9</th> <th>7.5</th> <th>6.1</th> <th>1.4</th> <th>က</th> <th>5.7</th>	1000	2.6	2	4.5	4.3	3.9	6.4	6.3	8.9	7.2	9.8	9.9	2.9	9.9	7.5	6.1	1.4	က	5.7
4.4 4.8 4.8 4.4 2.1 7.4 5.2 6 5.2 3.6 7.2 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7	1100	1.6	3.1	5.1	3.5	3.2	22	5.8	8.3	6.1	8.3	5.2	4.3	5.1	6.1	7.2	2.5	2.7	9.9
44 52 5 16 29 19 59 38 54 78 42 63 67 84 26 83 67 84 85 65 67 67 89 67 89 65 89 91 96 77 71 89 97 89 97 97 47 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 87 </th <th>1200</th> <th>2.7</th> <th>3.4</th> <th>4.8</th> <th>4.8</th> <th>1.8</th> <th>4.4</th> <th>2.1</th> <th>7.4</th> <th>5.2</th> <th>9</th> <th>5.2</th> <th>3.6</th> <th>9</th> <th>7.2</th> <th>1.7</th> <th>2.7</th> <th>3.2</th> <th>7.8</th>	1200	2.7	3.4	4.8	4.8	1.8	4.4	2.1	7.4	5.2	9	5.2	3.6	9	7.2	1.7	2.7	3.2	7.8
4.7 6.8 1.0 2.3 2.1 7.6 1.1 4.9 9.4 6.5 5.7 8.4 9.5 2.7 8.4 9.5 5.7 8.4 6.5 5.7 8.4 9.3 6.5 8.9 9.1 9.0 9.1 9.0 9.0 9.1 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 <th>1300</th> <th>4.4</th> <th>5.2</th> <th>2</th> <th>5</th> <th>1.6</th> <th>2.9</th> <th>1.9</th> <th>5.9</th> <th>3.8</th> <th>5.4</th> <th>7.8</th> <th>4.2</th> <th>6.3</th> <th>6.7</th> <th>8</th> <th>2.6</th> <th>8.4</th> <th>7.9</th>	1300	4.4	5.2	2	5	1.6	2.9	1.9	5.9	3.8	5.4	7.8	4.2	6.3	6.7	8	2.6	8.4	7.9
67 6.0 10.0 9 5.2 1.3 6.3 2.9 7.3 9.3 6.5 8.9 9.1 8.9 9.1 8.9 9.1 9.0 9.0 9.1 9.2 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3	1400	4.7	4.7	8.3	6.8	1	2.3	2.1	7.6	1.1	4.9	9.4	6.5	5.7	8.4	9.6	2.5	4.7	8.7
8.4 8.3 8.9 10.2 5.9 1 4.4 3.5 1.9 2.5 6.6 7 7.1 9.1 9.8 9.7 5.1 8.5 7.3 9.1 9.3 3.7 12.4 5.3 2.6 6.5 5.6 9.8 9.1 9.1 4.1 4.1 4.1 8.2 5.6 6.5 5.6 9.8 9.1 9.1 4.1 4.1 4.1 8.2 5.6 6.5 5.7 9.3 2.6 6.6 8.4 3.7 10.4 9.7 9.3 4.1 4.1 4.1 8.2 5.2 5.2 5.2 5.2 7.7 9.3 2.4 3.7 1.2 4.7 3.7 1.2 8.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	1500	6.7	9	10.6	6	5.2	1.3	5.7	8.8	3.5	2.9	7.3	9.3	6.5	8.9	9.1	8.9	10.2	9.7
85 73 91 93 8 36 36 37 124 53 26 65 6 98 91 91 91 41 67 73 73 74 29 77 09 26 6 44 37 104 92 79 41 46 61 68 56 6 55 24 3 12 1 39 37 13 93 76 53 46 42 54 65 55 47 37 17 38 36 24 32 47 51 83 7 33 41 42 37 42 45 37 14 33 34 12 43 35 34 12 43 43 42 43 43 42 43 43 43 44 45 43 45 45 45 45 45 43	1600	9.4	8.3	8.9	10.2	5.9	-	4.4	3.5	1.9	2.5	9.9	7	1.1	9.1	8.6	9.7	5.1	8.3
6.7 7.3 7.9 7. 4.2 2.9 7.7 0.9 2.6 6 4.4 3.7 10.4 9.2 7.9 4.1 4.1 4.2 7.9 7.7 0.9 2.6 6 5.5 2.4 3 1.2 1 3.9 3.7 1.3 9.3 7.6 5.3 4.6 4.2 5.4 6.5 5.5 4.7 3.7 1.3 9.3 4.7 5.1 8.3 4.7 8.1 8.3 4.7 8.1 8.3 4.1 8.3 4.7 8.1 8.3 4.7 8.1 8.3 4.1 8.3 8.1 8.3 8.4 1.2 8.3 8.4 8.1 8.2 8.4 8.1 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2	1700	8.5	7.9	9.1	9.3	&	3.6	3.7	12.4	5.3	2.6	6.5	2	9.9	9.8	9.1	9.1	4.1	7.2
4.6 6.1 6.8 5.5 6.4 3 1.2 1 3.9 3.7 1.3 9.3 7.6 5.3 4.6 4.2 5.4 6.5 5.5 4.7 3.7 1.7 3.8 3.6 2.4 3.2 4.7 5.1 8.3 7 3.3 4.1 4.2 3.7 4.5 2.9 4.5 3.9 2.4 3.1 0.8 2.8 6.1 3.5 7.4 6.1 2.2 3.3 4.1 2.9 3.2 3.3 4.8 1.4 3.3 3.4 1.2 4.9 2 5.7 4.8 2.4 1.2 2.3 2.1 2.5 2.6 3.4 3.8 4.6 0.3 6.7 4.2 0.4 6 1.2 5.7 4.8 2.7 1.4	1800	6.7	7.3	7.9	7.7	7	4.2	2.9	7.7	6:0	2.6	9	4.4	3.7	10.4	9.2	7.9	4.1	9
4.2 5.4 6.5 5.5 4.7 3.7 1.7 3.8 3.6 2.4 3.2 4.7 5.1 8.3 7 3.3 4.1 4.2 3.7 4.2 4.5 3.9 4.5 3.4 3.1 0.8 2.8 6.1 3.5 7.4 6.1 2.2 3.3 4.1 2.9 3.2 2.6 3.4 3.3 4.8 1.4 3.3 3.4 1.2 4.9 2 5.7 4.8 2.4 1.2 2.3 2.1 2.5 2.6 3.4 3.8 4.6 0.3 6.7 4.2 0.4 6 1.2 5.7 4.8 2.7 1.4	1900	4.6	6.1	6.8	5.6	9	5.5	2.4	e	1.2	-	3.9	3.7	1.3	9.3	7.6	5.3	4.6	4.5
42 37 42 45 29 45 39 24 31 08 28 61 35 74 61 22 33 29 32 26 34 33 48 14 33 34 12 49 2 57 48 24 12 23 21 25 26 34 38 46 03 67 42 04 6 12 52 54 27 14	2000	4.2	5.4	6.5	5.5	4.7	3.7	1.7	3.8	3.6	2.4	3.2	4.7	5.1	8.3	7	3.3	4.1	3.3
2.9 3.2 2.6 3.4 3.3 3.3 4.8 1.4 3.3 3.4 1.2 4.9 2 5.7 4.8 2.4 1.2 2.3 2.1 2.5 2.6 3.4 3.8 4.6 0.3 6.7 4.2 0.4 6 1.2 5.2 5.4 2.7 1.4	2100	4.2	3.7	4.2	4.5	2.9	4.5	3.9	2.4	3.1	9.0	2.8	6.1	3.5	7.4	6.1	2.2	3.3	2.4
23 2.1 2.5 2.6 3.4 3.8 4.6 0.3 6.7 4.2 0.4 6 1.2 5.2 5.4 2.7 1.4	2200	2.9	3.2	2.6	3.4	3.3	3.3	8.4	1.4	3.3	3.4	1.2	4.9	2	5.7	4.8	2.4	1.2	1.6
	2300	2.3	2.1	2.5	2.6	3.4	3.8	4.6	0.3	6.7	4.2	0.4	9	1.2	5.2	5.4	2.7	1.4	0.3

VI.3.2 Wind Speed Data (mph)—Aldine

6 4.3 2.6 3 7 3.6 2.3 2.3 1 5.9 2.7 2.5 1 5.9 2.7 2.5 3 4.1 2.1 2.4 4 4.5 3 3.1 4 4.5 3 3.1 4 4.1 2.9 6.4 8 2.4 1.7 5.2 9 2.5 5.4 3.9 1 2.4 2.9 6.4 2 2.4 1.7 5.2 3 2.5 5.4 3.9 4 2.4 5.6 5.6 4 4.1 2.9 6.4 5 5.1 5.6 4 6 5.5 3.1 5.6 7 5.6 4 5.6 8 4 2.7 5.9 8 4 2.7 5.9 8 5.9 7.4 9 2.5 5.6 1 5 5.6 2 1.8 5.2 3 1.2 2.7 6.2 3 2.3 3.2 6.3 3	12-Sep	12-Sep 13-Sep 14-Sep 15-Sep	14-Sep	15-Sep	16-Sep 17-Sep	17-Sep
4.3 2.6 3 3.6 2.3 2.3 4.1 2.1 2.4 5.9 2.7 2.5 5.8 3.8 2.2 5.8 3.8 2.2 4.5 3 3.1 4.5 3 3.1 3 3.2 2.3 4.1 2.9 7.7 4.1 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 2.4 2.9 6.4 3.4 1.2 6.4 5 5.6 4 5 5.6 4 4 2.7 5.9 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 1.5 2.7 6.2 2.3 3.2 6.3						
3.6 2.3 2.3 4.1 2.1 2.4 5.8 3.8 2.2 5.8 3.8 2.2 5.8 3.8 2.2 4.5 3 3.1 4.5 3 3.1 4.1 2.9 7.7 4.1 2.9 7.7 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.4 3.4 1.2 6.4 5.1 5.5 5.4 5.1 5.5 3.1 5.1 5.5 3.1 5.5 5.6 4 5 5.6 4 6.3 5.5 3.1 1.5 1.8 5.2 1.5 1.8 5.2 1.5 1.8 5.2 1.5 1.8 5.2 1.5 2.7 6.2 2.3 3.2 6.3 2.3 3.2 6.2 2.3 3.2 6.3 2.3 3.2 6.3 2.3 3.2 6.3 2.3 3.2 6.3 3.8 2.9 6.2	9.0	4.3	2.6	3	2.5	2.3
4.1 2.1 2.4 5.8 3.8 2.2 5.8 3.8 2.2 5.5 2.3 2.3 2.3 4.5 3 3.1 3.1 4.7 2.3 5.2 3.3 4.1 2.9 6.4 3.9 2.4 1.7 5.2 5.4 2.4 1.7 5.2 6.4 2.4 1.7 5.2 6.4 2.4 1.7 5.2 6.4 5.1 5.3 5.4 6.4 5.1 5.3 5.4 6.4 5.3 5.5 4 4 2.7 5.9 1.5 1.8 5.2 1.4 1.5 1.8 5.2 1.4 1.5 1.8 5.2 1.4 1.5 1.8 5.2 1.4 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2 1.5 1.8 5.2 1.2	2.0	3.6	2.3	2.3	1.8	2.9
5.9 2.7 2.5 5.8 3.8 2.2 5.5 2.3 2.3 4.5 3 3.1 3 3.2 2.3 4.1 2.9 7.7 4.1 2.9 7.7 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.2 5.1 5.6 5.6 5.1 5.3 5.4 5.1 5.3 5.4 5.5 5.6 4 5.6 5.6 4 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 1.5 1.8 5.2 2.3 3.2 6.3 2.3 3.2 6.3	1.3	4.1	2.1	2.4	2	1.6
5.8 3.8 2.2 5.5 2.3 2.3 4.5 3 3.1 3 3.2 5.2 1.5 4.1 7.2 4.1 2.9 7.7 4.1 2.9 7.7 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.4 3.4 1.2 6.4 5.1 5.5 5.4 5.1 5.5 3.1 5.5 5.6 4 4 2.7 5.9 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3 2.3 3.2 6.3 2.3 5.5 5.5	1.1	5.9	2.7	2.5	2.6	1.5
5.5 2.3 2.3 2.3 4.5 3 3.2 5.2 1.5 4.1 7.2 7.7 4.1 2.9 6.4 7.7 2.4 2.9 6.4 5.2 2.4 1.7 5.2 5.6 2.4 1.7 5.2 5.6 3.4 1.2 6.4 5.6 5.1 5.3 5.4 6.4 5.3 5.5 3.1 6.4 5.4 5.5 3.1 6.4 5.3 5.5 3.1 7.4 4 2.7 5.9 7.4 1.5 1.8 5.2 7.4 1.5 1.8 5.2 7.4 1.5 1.8 5.2 7.4 1.5 2.7 6.2 5.6 2.3 3.2 6.3 5.6	1.3	5.8	3.8	2.2	2.2	2.5
4.5 3 3.1 3 3.2 5.2 1.5 4.1 7.2 4.1 2.9 7.7 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.2 2.4 1.7 5.6 3.4 1.2 6.4 5.1 5.3 5.4 5.3 5.5 3.1 5 5.6 4 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	1.7	5.5	2.3	2.3	4.9	2.6
3 32 52 4.1 7.2 4.1 2.9 7.7 2.4 2.9 6.4 2.4 1.7 5.2 2.5 5.4 3.9 2.4 1.2 6.4 3.4 1.2 6.4 5.1 5.3 5.4 5.9 5.5 3.1 5.9 5.5 4 4 2.7 5.9 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3		4.5	3	3.1	5.5	3.8
4.1 7.2 4.1 2.9 7.7 2.4 2.9 6.4 2.4 1.7 5.2 2.4 1.7 5.2 2.4 5.6 5.6 3.4 1.2 6.4 5.1 5.3 5.4 5.3 5.5 3.1 5 5.6 4 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	1.4	3	3.2	5.2	4.5	5.3
4.1 2.9 7.7 2.4 2.9 6.4 2.4 1.7 5.2 2.5 5.4 3.9 2.4 5.6 5.6 2.4 5.6 5.6 3.4 1.2 6.4 5.1 5.3 5.4 5 5.6 4 4 2.7 5.9 1.5 1.8 5.2 1.5 1.8 5.2 2.3 3.2 6.3 2.3 3.2 6.3	1.4	1.5	4.1	7.2	5.7	5.8
2.4 2.9 6.4 2.9 2.4 2.9 2.4 3.9 2.4 3.9 2.4 3.9 2.4 2.7 2.4 2.7 2.9 2.9 2.9 2.9 2.9 2.9 2.9 2.9 2.9 2.9	2.4	4.1	2.9	1.7	9.7	6.1
2.4 1.7 5.2 2.4 2.5 5.4 3.9 2.4 5.6 5.6 5.6 5.4 5.9 5.4 4.2 5.9 7.4 7.2 6.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7	1	2.4	2.9	6.4	1.7	6.5
2.5 5.4 3.9 2.4 3.9 3.4 1.2 6.4 5.6 5.6 5.9 5.1 5.3 5.4 4 4 2.7 5.9 7.4 1.2 2.3 3.2 6.3 5.3 5.5 5.6 5.6 5.6 5.6 5.6 5.6 5.6 5.6 5.6	1.8	2.4	1.7	5.2	8.1	7
2.4 5.6 5.6 3.4 1.2 6.4 5.1 5.3 5.4 5.9 5.5 3.1 5 5.6 4 4 2.7 5.9 3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	1.9	2.5	5.4	3.9	5.7	5.8
5.1 5.3 5.4 5.9 5.4 5.9 5.9 5.6 4 7.4 5.9 7.4 7.7 5.9 7.4 1.5 1.8 5.2 7.4 5.3 2.3 3.2 6.3	7.4	2.4	5.6	5.6	5.7	5.8
5.1 5.3 5.4 5.9 5.5 3.1 5 5.6 4 4 2.7 5.9 3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	9.7	3.4	1.2	6.4	6.8	3.2
5.9 5.5 3.1 5 5.6 4 4 2.7 5.9 3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	8.5	5.1	5.3	5.4	7.3	3.2
5 5.6 4 4 2.7 5.9 3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	8.8	5.9	5.5	3.1	7.1	4.8
4 2.7 5.9 3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	8.1	5	5.6	4	8.9	3.9
3.8 2.9 7.4 1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	6.8	4	2.7	5.9	2.7	1.6
1.5 1.8 5.2 1.2 2.7 6.2 2.3 3.2 6.3	6.2	3.8	2.9	7.4	1.2	9.0
1.2 2.7 6.2 2.3 3.2 6.3	9.2	1.5	1.8	5.2	7.0	9.0
2.3 3.2 6.3 1	3.3	1.2	2.7	6.2	8.0	1.7
	2.5	2.3	3.2	6.3	1.1	0.5
.6 2 2.7 4.4 1	1.6	2	2.7	4.4	1.4	0.4

VI.3.3 Wind Direction (0-359 degrees)—Aldine

14-Aug 15-Aug 16-Aug 17-Aug 18-Aug 19-Aug 20-Aug 21-Aug 22-Aug 23-Aug 24-Aug		29 0	1 28	1 51	4 41	4 79	33	353	3 14	3 2	5 344	316	103 336	5 330	127	0 103		109 106							
2-Aug 23-7		162 130	284 111	268 74	330 64	34 64	41 58	27 11	24 38	14 23	19 35	60 92	184 10	130 85	103 94	64 110		-	 						
21-Aug 2		204	175	233	204	223	392	10	324	293	230	10	182	128	105	124		129	129	129 134 137	129 134 137 148	129 134 137 148	129 134 137 148 155 160	129 134 148 155 160 154	129 134 137 148 155 160 154
20-Aug		219	223	222	238	23	42	16	136	280	279	255	236	240	198	206		195	195 167	195	195 167 141 151	195 167 141 151 171	195 167 141 151 171 172	195 167 141 151 171 172 175	167 141 151 171 172 175
19-Aug		245	232	255	236	210	16	232	289	283	255	241	243	236	213	201	168	- 00	133	133	133	133 142 147 175	133 142 147 175 180	133 142 147 175 180 180	142 147 175 180 181 181
18-Aug		213	226	223	218	199	315	316	273	237	236	231	231	183	206	187	143		145	145 142	145 142 164	145 142 164 166	145 142 164 166 170	145 142 164 166 170 173	145 142 164 166 170 173
17-Aug		239	238	250	265	392	897	273	274	627	569	273	258	218	119	178	137		157	157	157 136 148	157 136 148 162	157 136 148 162 174	157 136 148 162 174 187	157 136 148 162 174 187
16-Aug		202	208	219	241	197	23	2	321	271	276	291	301	320	294	234	243		275	275 259	275 259 152	275 259 152 155	275 259 152 155 180	275 259 152 155 180 206	275 259 152 155 180 206 228
15-Aug		141	137	28	37	83	105	66	118	161	144	167	149	135	138	151	144		162	162 159	162 159 132	162 159 132 143	162 159 132 143 180	162 159 132 143 180	162 159 132 143 180 181
14-Aug		95	331	12	45	48	22	23	28	96	102	112	129	132	132	128	140		143	143	143 136 132	143 136 132 130	143 132 130 132	143 132 130 132 69	143 132 132 132 132 68
13-Aug		275	344	55	347	328	250	251	342	328	14	46	99	83	79	91	102		115	115	119 130	115 119 130 129	115 130 129 133	113 130 133 133 135	119 130 133 135 121 121
10-Aug 11-Aug 12-Aug		116	197	104	63	87	95	11	81	31	69	21	40	20	113	82	100		124	124	125 143	125 125 143	124 143 143 173	124 143 143 173 183	125 125 143 143 173 183 246
11-Aug		226	263	366	270	289	528	255	386	236	282	284	226	240	278	253	230		231	113	113 23	113 130	113 110 130 51	113 110 130 51 312	113 113 130 342 308
10-Aug		278	261	277	2	279	101	98	5/	588	231	274	273	257	291	321	89	400	971	158	158 158 159	158 163 176	158 163 176 174	158 163 176 174 198	128 163 176 174 198 208
09-Aug		172	172	326	32	133	84	360	81	116	137	193	213	182	155	116	124	00.7	2	8 8	130	133 132	132 133 154 154 155	133 133 176 176	130 132 176 166
08-Aug		169	109	192	108	109	106	154	153	166	173	164	178	119	210	313	20	0	ጽ	සු ස	308 176	308 176 143	308 176 143 151	308 176 143 151	308 176 143 151 161 168
07-Aug		181	177	153	145	108	88	101	167	170	206	244	163	115	127	146	136	-	153	15 14	138	136 129	136 136 148	153 136 129 148 157	136 128 148 157 162
a property of the state of the	NE.	0	100	200	300	400	200	009	700	800	006	1000	1100	1200	1300	1400	1500		1600	1700	1700	1700 1800 1900	1500 1700 1800 1900 2000	1500 1800 1900 2000 2400	1500 1700 1800 2000 2200 2200

VI.3.3 Wind Direction (0-359 degrees)—Aldine

		-	50-AU	53-Aug	30-Aug	Jan-Pug	1-7ch	luz-sep	U3-Sep	U4-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
_	216	170	190	221	243	274	253	200	235	252	317	1.1	20	93	99	96	122
100 46	258	139	184	251	259	270	243	287	250	254	234	14	94	74	75	83	131
200 25	233	140	164	4	254	270	256	270	258	242	210	29	-6	69	84	99	128
300 31	59	366	240	45	257	265	263	366	271	248	262	09	90	54	53	79	116
400 110	65	200	246	70	268	271	255	214	271	278	116	38	79	37	54	84	97
200 65	44	277	28	19	278	251	268	242	271	267	317	42	69	34	53	88	69
600 92	138	14	94	34	295	266	269	239	261	276	83	37	29	41	96	217	90
700 82	305	88	69	346	536	297	278	253	792	285	ઝ	45	89	30	20	126	124
800 111	296	138	198	239	284	295	274	256	270	238	17	95	81	40	48	194	160
900 349	230	177	192	233	295	290	265	261	277	314	31	69	64	36	118	240	318
1000 67	143	196	194	227	293	297	252	277	269	337	354	92	48	36	88	264	90
1100 130	203	175	168	312	294	295	264	278	273	5	344	73	37	47	88	180	111
1200 92	504	98	179	237	263	340	279	261	288	22	4	93	59	54	128	187	116
1300 103	187	151	163	172	781	310	269	294	292	88	14	54	59	70	125	148	134
1400 134	177	132	128	211	195	304	246	229	258	92	18	ಟ	49	74	144	176	138
1500 115	123	133	33	202	229	262	241	202	205	82	50	29	83	84	121	159	145
1600 114	137	144	145	156	38	204	346	178	237	101	81	71	91	80	137	145	151
1700 135	150	149	145	136	189	217	322	358	240	135	42	8	103	83	139	136	156
1800 138	156	1 60	159	165	166	222	258	5	255	145	43	111	105	83	133	143	164
1900 150	165	170	170	8	179	133	235	355	309	150	48	33	102	88	126	151	168
2000 176	174	170	174	172	194	160	20	302	148	166	42	123	94	8	109	138	155
2100 172	175	196	181	182	208	239	108	212	174	177	42	142	95	79	92	135	137
2200 164	185	170	180	211	223	252	253	232	235	194	44	102	92	65	101	144	136
2300 176	176	187	183	222	258	265	174	234	245	347	63	69	77	09	88	127	97

VI.3.3 Wind Direction (0-359 degrees)—Aldine

	12-Sep	12-Sep 13-Sep	14-Sep 15-Sep	15-Sep	16-Sep	17-Sep
81		128	87	340	69	23
121		88	54	334	54	30
141	_	48	32	308	48	36
125	10	59	27	304	25	33
149	_	6	32	310	16	21
149	_	36	34	308	34	35
101		35	28	316	41	37
108		36	89	337	42	46
163	_	328	99	347	45	63
170	_	40	100	343	39	71
263		358	165	340	43	83
119	_	25	348	335	47	95
98		139	255	357	54	44
107		10	251	334	41	56
104		62	39	323	38	51
112		66	112	309	65	94
112		102	114	226	99	26
108	_	116	340	50	59	96
120		96	333	34	35	139
82		93	327	36	27	8
99		34	5	48	348	50
56		30	339	90	6	106
356		107	329	62	6	208
94		125	280	69	1	300

VI.3.4 Ozone (ppb)—Aldine

	07-Aug	07-Aug 08-Aug 09-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	10-Aug 11-Aug 12-Aug 13-Aug 14-Aug 15-Aug 16-Aug 18-Aug 18-Aug 20-Aug 21-Aug 22-Aug 23-Aug 24-Aug	23-Aug	24-Aug
TIME																		
0	3	0	10	0	7	22	36	0	0	0	6	8	30	14	6	1	14	0
100	0	0	SPN	0	4	16	SPN	0	0	SPN	11	4	36	SPN	5	0	SPN	0
200	0	0	NdS	0	1	5	SPN	0	0	SPN	7	2	20	SPN	3	0	SPN	0
300	0	0	0	0	9	0	1	0	0	0	9	1	11	8	4	1	9	0
400	0	0	0	0	3	0	0	0	0	0	9	0	7	5	3	1	11	0
200	0	0	0	0	0	0	0	0	0	0	-	0	4	1	3	0	3	0
009	0	0	0	0	0	0	1	1	0	0	0	0	1	3	1	1	1	0
700	1	4	0	0	4	16	16	14	7	3	5	3	10	19	5	5	9	2
800	8	16	12	12	10	34	42	36	13	10	11	16	39	33	16	30	24	20
800	19	28	23	22	19	25	64	39	19	18	19	26	25	42	25	45	35	42
1000	31	38	35	27	53	96	11	38	92	27	32	37	89	48	33	29	35	ಜ
1100	45	46	53	44	44	127	74	51	43	40	49	51	83	54	63	29	37	88
1200	7.0	34	59	62	69	110	75	52	99	54	69	83	92	64	98	48	36	83
1300	83	36	72	69	88	79	29	55	99	65	82	95	111	75	127	48	38	88
1400	76	14	101	98	88	74	70	44	48	89	111	103	108	77	153	88	54	99
1500	89	10	85	112	103	73	72	40	23	7.0	150	111	120	75	132	87	99	35
1600	91	3	67	145	106	75	76	34	26	64	126	101	122	92	127	107	53	22
1700	46	3	53	123	66	70	94	23	22	29	105	78	98	75	98	33	88	24
1800	33	7	23	77	90	99	32	13	6	36	99	23	58	88	48	61	51	13
1900	16	4	5	24	25	90	65	6	0	5	41	48	44	24	40	æ	34	2
2000	10	2	0	13	53	39	49	9	7	1	26	35	44	17	22	23	15	0
2100	14	3	4	3	46	44	23	3	9	13	19	18	41	14	25	10	2	0
2200	4	7	0	8	37	30	10	0	2	11	19	18	23	13	12	7	0	0
2300	0	12	0	10	23	26	1	3	0	10	14	22	21	9	9	10	0	0

VI.3.4 Ozone (ppb)—Aldine

VI.3.4 Ozone (ppb)—Aldine

	7				
	2				
		0	0	41	8
	SPN	0	0	27	NdS
	SPN	0	1	27	SPN
	5	0	0	32	24
_	7	0	0	23	31
noc noc	2	0	0	22	29
0 009	2	0	0	21	28
200 0	2	0	3	33	37
9 008	1	6	12	43	46
900 16	4	23	22	51	54
1000 41	7	30	24	19	62
1100 70	11	28	33	89	59
1200 100	11	34	69	1.2	29
1300 89	7	31	81	14	89
1400 42	13	31	85	72	74
1500 49	30	44	87	71	1.2
1600 38	29	45	94	69	69
1700 29	20	29	77	63	61
1800 20	6	16	73	38	32
1900 18	2	3	63	15	3
2000 26	1	0	25	4	0
2100 20	0	0	22	0	0
2200 13	2	0	53	0	0
2300 8	က	0	49	0	0

VI.4 TNRCC DATA--CONROE

- VI.4.1 Temperature Data (°F)--Conroe
- VI.4.2 Wind Speed Data (mph)-Conroe
- VI.4.3 Wind Direction (0-359 degrees)--Conroe
- VI.4.4 Ozone (ppb)—Conroe
- VI.4.5 Particulate Matter (µg/m³)—Conroe

VI.4.1 Temperature Data (°F)—Conroe

07-AU	07-Aug 08-Aug 09-Aug 10-Aug 11-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	[12-Aug]13-Aug]14-Aug]15-Aug]16-Aug]17-Aug 18-Aug 19-Aug 20-Aug 21-Aug 22-Aug 23-Aug 24-Aug	22-Aug	23-Aug	24-Aug
TIME																	
0 79.5	79.1	76.8	74.1	81.2	75.4	78.7	72.7	78.3	75.5	81.1	90.8	77.5	77.1	73	78.4	76.6	74.3
100 78.1	77.2	75.1	73.5	79.3	74.4	8.92	71.8	77.4	74.9	79.4	78.5	75.9	75.7	17	77.3	75.1	73.9
200 76.2	75.5	73.9	73.2	78.1	73.6	75.9	71.1	75.7	72.6	78	75.6	75.7	74.5	75.6	75.6	7.47	73.4
300 74.3	74.4	72.6	71.8	76.6	72.4	75.9	6.07	74.8	7.17	11	73.4	75.3	73.9	74.3	73.9	73.8	72.8
400 73.8	74.3	72.1	6.07	76.4	71.5	73.8	9.07	74.4	72	92	72.3	73.7	73.9	73.4	73.1	73.5	72.5
500 72.5	74.1	71.3	8.69	76.8	70.5	73.5	70.2	74.5	71.1	75.4	7.07	72.7	71.8	73.2	72.7	73.5	72
600 73	75.8	72.4	70.5	77.3	71.1	73.9	72	75.3	71.8	75.9	1.1	72.7	70.3	72.6	73.5	73	72.8
700 78	80.2	77.3	76.4	7.67	75.7	78.1	78.3	79.7	77.9	78.8	5'11	17.22	76.2	7.97	8.77	74.6	76.3
800 83.1	83.8	82.7	81.7	83.4	9.08	82.7	84.4	84.6	82.4	83.1	81.3	82.1	81.4	82.6	82.8	78.6	9.08
900 86.4	86.7	85.5	85.8	87.8	82.8	87.4	86.9	86.9	85.1	6.98	84.6	85.4	84.9	95.6	84.9	82.6	84.3
1000 89.2	88.3	88	88.7	92.3	89.2	91.5	90.2	88.3	88.2	90.5	88.3	88.8	88	89.3	2'98	88	86.9
1100 90.8	91.5	90.9	91.7	95.8	92.5	94.2	91.2	80.8	91	93.5	2'16	8,18	90.3	92.1	89.2	87.9	88.2
1200 92.5	92.4	92.6	94	97.5	94.5	95.7	92.8	92.2	93.5	86.3	94	94.6	83	94.6	9.08	83.3	16
1300 94	96.6	94.5	96.2	98.9	296.7	36.2	94.4	94.3	95.5	97.1	96.2	96.3	95	96.5	71.8	79.5	92.3
1400 94.8	77.4	95.7	97.5	98.6	98.1	9.96	95.3	94.6	96.8	97.6	98	97.6	97	97.2	74.2	84.1	93.2
1500 95.5	77.7	96.7	98.3	100.2	99.5	96.9	94.5	94.9	97.9	97.6	98.5	98.7	97.9	98.3	78.3	85.3	84.5
1600 95.2	8	9.96	98.5	99.9	98.8	96.9	93.4	93.6	98.4	98.7	98.6	38.5	97.7	98.4	82.1	85.2	98
1700 93.5	81.8	94.9	97.7	88	98.9	96.1	91.1	91	98.2	97.5	97.6	97.9	97.2	95.8	83.2	84.9	83
1800 90.4	82.2	91.8	98	82.5	97	92.7	89.1	86.7	36.5	95.2	93.8	94.5	95.3	93.7	82.5	84.2	81.1
1900 87	80.3	87.8	92.5	80.9	94.8	88.5	86.5	83.5	92.6	92	90	89.3	90.6	90.1	79.8	82.5	78.7
2000 84.5	79	84.6	88.8	77.5	89.7	85.1	84.4	81.9	88.1	98.6	86.8	86.1	87.6	87.5	78.2	80	5.77
2100 82.9	79	82.2	86.1	79.3	87.7	81.1	82.7	80.8	85.2	86.2	84.2	82.9	85.3	84.3	29.3	77.6	76.4
2200 81.4	78.8	8	84.5	78.3	84.1	6.77	84	80.2	83.7	83.9	81.8	80.3	82.8	81.7	5'11	76.1	74.6
2300 80.5	77.8	77.4	00.0	6 31	0	0.75	001	000	-	000	3 32						

VI.4.1 Temperature Data (°F)—Conroe

	25-Aug	26-Aug	27-Aug	27-Aug 28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep 04-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	73	77.5	77	78.1	7.87	81.2	84	86.2	81.2	83.1	83.4	81.5	83.7	77.4	74	75.3	76	78.8
100	71.7	76.1	74.2	76.4	9.77	79.6	81.9	84.7	80.5	81.8	84.8	79.6	20	75.3	74	7.4.7	75.9	78.1
200	71.6	75.1	72.2	73.9	92	78.3	84	81.7	80.1	90.8	82.1	78.2	78.4	76.5	73	74.1	74.8	77.2
300	71.2	73	71.3	73.1	73.3	77.1	79.2	79.8	80.5	78.9	78.7	77.1	75.7	75.2	72.5	74.3	74.4	11
400	70.5	71.3	70.3	71.7	71.7	75.9	7.92	8.77	79.5	77.8	78	76.2	72.7	73.4	617	74.4	73.9	75.5
200	70.4	70.7	69.5	70.8	71	75.6	75.4	79.4	78.7	77.2	6.97	75.5	8.69	72	72.1	74.3	73.7	74.4
009	70.8	71.1	70.5	71.1	71.2	76.4	76.5	79.4	78.3	17.7	6.97	75.5	69.4	71.9	72.2	74.3	74.1	74.4
200	73.9	76.1	76.3	77.2	77.8	79	82.2	83.8	80.1	82.5	82.2	82.4	72.7	75.4	73	7.4.7	7.97	75.7
88	79.4	80.8	82.4	83.2	82.3	82.1	87.9	88.4	82.6	87.7	91.4	90.9	76.3	78.7	74	75.7	81.7	80
900	84.1	83.8	85.3	86.1	85.4	85.3	93.2	92.3	84.8	91.4	97.1	96.5	79.7	81.3	92	672	84.7	84.5
1000	85.9	87.3	9.88	89.1	88.8	89.3	97.6	96.9	90.1	95.5	101.4	100.4	83	85	78.1	81.4	85.9	88
1100	88.3	90.2	91.2	91.4	91.7	93.3	100.4	100.6	96.2	88.9	104.2	102	2.98	87.9	9.08	84.8	88.5	89.5
1200	90.6	92.2	93.7	93.6	94.3	898	102.3	103.1	99.4	101.7	106.1	103.5	90.1	89.5	82.5	87.1	91.3	98
1300	92.8	94.5	95.1	94.9	96.5	99.3	103.3	104.3	101.5	102.3	107	103.5	92	91	85.4	89.7	93.3	83.8
1400	94.5	95.4	96.2	96.7	88 1.	101.3	103.7	103.9	102.7	103.4	106.8	103.3	92.7	92	86.4	89.1	94.8	83.1
1500	94.5	96.3	96.9	97.2	100	102.5	104	104.5	103.3	104.7	107.5	102.6	93	35	85.7	88.9	92.9	9.98
1600	94.8	96.3	96.2	96.7	100.2	103	104.5	91.1	103.5	105	107.3	102.2	93.5	91.5	98	88	91.7	88
1700	93.8	95.2	93.2	95.3	99.1	102.4	104.2	88.7	101.8	103.7	106.4	101.3	93.1	89.2	84.6	87.4	88.4	88.8
1800	91.2	92	8	91.9	95.7	88.8	100.5	88.2	96.4	99.7	103.2	98.6	91.5	86.2	82.6	84.7	85.8	86.5
1900	87.8	88.4	87.1	88.2	91.5	92.8	93.7	96.1	91.9	95.7	26.7	94.5	88.2	82.8	79.5	82.4	84.2	84.3
2000	84.8	92.6	88	85.7	88.7	91.7	92.5	83.6	88	83	93.6	90.7	88	79.9	77.9	90.8	83.3	82.5
2100	82.7	83.2	æ	83.4	98.1	90.1	91.6	83	88.2	89.9	89.7	88.7	84.7	77	76.5	79	82.2	80.9
2200	<u></u>	8	80.9	81.3	84.1	87.5	9.68	80.7	86.8	86.5	87	8.98	82.1	75.3	75.9	78.2	80.9	78.9
2300	79.5	79.2	79.3	79.8	82.9	86.1	88.1	80.4	84.7	83.3	83.6	85.5	79.7	74.1	75.9	77.2	7.67	77.4

VI.4.1 Temperature Data (°F)—Conroe

TIME 75.8 74.7 75.7 74 71.6 65.6 100 75.9 74 75.1 73.5 70.4 64.7 200 75.3 73.8 74.3 73.5 70.4 64.7 300 75.2 74.1 73.7 72.8 65.8 63.6 500 75.2 74.1 73.7 72.8 65.8 61.7 500 75.2 74.1 73.7 72.8 65.8 61.7 500 75.2 74.1 73.7 72.8 65.8 61.7 500 75.2 74.1 73.7 72.8 65.8 61.7 800 75.1 74.2 72.8 64.6 60.8 60.8 900 75.1 74.5 75.3 74.2 68.8 65.7 77.8 1300 87.1 75.3 84.8 88.1 87.1 77.8 74.8 1400 80.1 77.5 74.1 8		12-Sep	13-Sep	14-Sep	15-Sep	12-Sep 13-Sep 14-Sep 15-Sep 16-Sep 17-Sep	17-Sep
76.8 74.7 75.7 74 71.6 75.9 74 75.1 73.5 70.4 75.2 73.8 74.3 73.5 68.4 1 75.2 74 74 72.8 67.6 67.6 75.2 74.1 73.7 72.8 67.6 67.6 75.1 74.3 73.6 72.3 64.6 68.6 75.1 74.3 73.5 72.3 64.6 68.6 75.2 74.3 73.6 72.3 64.6 74.6 75.2 74.3 73.6 72.3 64.6 74.6 83.7 74.8 73.5 74.3 74.9 68.6 74.9 83.7 75.3 84.8 88.1 80.7 74.9 84.8 84.8 80.6 77.5 74.1 89.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 <td< th=""><th>TIME</th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	TIME						
75.9 74 75.1 73.5 70.4 75.2 74 74.3 72.8 67.6 75.2 74.1 73.7 72.8 67.6 75.2 74.1 73.7 72.8 67.8 75.2 74.1 73.7 72.3 64.6 75.1 74.5 73.5 72.3 64.6 75.1 74.5 75.1 74.9 74.9 75.2 74.5 75.2 64.4 68.6 83.7 74.5 75.2 64.6 68.6 83.7 74.5 75.2 64.6 68.6 83.7 74.5 76.3 74.9 74.9 68.6 83.7 75.3 84.8 88.1 80.7 80.5 80.6 80.5 85.9 76.6 86.9 92.9 84.8 80.6 84.8 80.7 86.9 76.9 77.5 74.1 89.8 84.8 77.5 77.5 74.2 <t< th=""><th>0</th><th>76.8</th><th>7.47</th><th>75.7</th><th>74</th><th>71.6</th><th>65.6</th></t<>	0	76.8	7.47	75.7	74	71.6	65.6
75.3 73.8 74.3 73 68.4 75.2 74.1 74 72.8 67.6 74.9 74.3 72 65.8 72 74.9 74.3 73.6 72 64.4 74.9 74.3 73.6 72.3 64.6 76.5 74.8 73.5 72.3 64.6 68.7 78.6 74.8 76.1 74.2 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.6 68 74.8 68 74.8 68 74.8 68 74.8 68 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 74.8 7	100	75.9	74	75.1	73.5	70.4	64.7
75.2 74 74 72.8 67.6 75.2 74.1 73.7 72 65.8 74.9 74.3 73.6 72 64.4 75.1 74 73.5 72.3 64.6 75.1 74 73.5 72.3 64.6 76.5 74.5 76.1 74.2 68.6 79.6 74.8 79.5 74.9 74.9 83.7 75 82.1 74.9 74.9 89.7 75.9 84.8 88.1 80.7 90.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.9 77.5 74.2 83.7 79.7 76.9 77.5 74.2 83.7 79.7 75. 76.9 77.5 78.1 77.5	200	75.3	73.8	74.3	73	68.4	63.6
75.2 74.1 73.7 72 65.8 74.9 74.3 73.6 72.3 64.4 75.1 74 73.5 72.3 64.6 76.5 74.5 76.1 74.2 68 76.6 74.8 76.3 74.6 68 83.7 75.9 84 83.8 77.7 87.1 75.9 84 83.8 77.7 80.7 79.3 84.8 89.7 84.2 81.6 87.9 84.8 89.7 87.2 81.6 87.1 92.9 84.8 80.9 76.6 77.1 92.9 84.8 80.9 76.6 77.1 92.9 84.8 80.5 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.9 77.5 74.2 83.7 79.7 76.9 76.9 77.5 74.2 83.7 79.7 76.9 76.9 77.5 76.9 77.5 76.9 77.	300	75.2	74	74	72.8	9'.29	63
74.9 74.3 73.6 72.3 64.4 75.1 74.5 75.1 72.3 64.6 76.5 74.8 73.5 72.3 64.6 79.6 74.8 75.1 74.2 68 87.1 75.2 82.1 73.5 74.9 87.1 75.3 84.8 88.1 80.7 89.7 79.3 84.8 88.1 80.7 91.6 87.1 82.1 80.7 80.7 91.6 87.2 87.1 82.9 84.8 90.6 77.5 74.1 89.8 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.2 83.7 79.7 75 76.9 73.9 76.7 68.5 75.5 76.4 73.9 76.7 68.5 75.9 76.4 77.1 74.8 68.3	400	75.2	74.1	73.7	72	65.8	61.7
75.1 74 73.5 72.3 64.6 76.5 74.5 76.1 74.2 68.6 79.6 74.8 79.5 76.3 71.6 83.7 75 82.1 78.5 74.9 83.7 75 82.1 78.5 74.9 89.7 79.3 84.8 88.1 80.7 91.6 81 85.5 90.6 82.5 91.1 76.6 86.9 92.9 84.8 90.6 77.5 74.1 89.8 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.3 77.5 74.1 89.8 84.8 76.3 77.5 74.2 83.7 79.7 76.3 76.9 77.5 74.2 83.7 79.7 76.3 76.5 76.9 77.5 78.2 68.5 76.5 76.4 73.9 <th>200</th> <th>74.9</th> <th>74.3</th> <th>73.6</th> <th>72</th> <th>64.4</th> <th>80.8</th>	200	74.9	74.3	73.6	72	64.4	80.8
76.5 74.5 76.1 74.2 68 79.6 74.8 79.5 76.3 71.6 83.7 75.9 84 83.8 77.7 87.1 75.9 84.8 83.8 77.7 91.6 81.6 86.9 82.5 82.5 91.6 87.1 92.1 83.2 84.8 91.7 76.5 87.1 92.9 84.8 89.9 76.6 77.1 92.9 84.8 86.9 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.2 83.7 79.7 75 76.9 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.5 76.4 73.9 76.7 68.3 </th <th>009</th> <th>75.1</th> <th>14</th> <th>73.5</th> <th>72.3</th> <th>64.6</th> <th>60.8</th>	009	75.1	14	73.5	72.3	64.6	60.8
79.6 74.8 79.5 76.3 71.6 83.7 75 82.1 79.5 74.9 87.1 75.9 84 83.8 77.7 89.7 79.3 84.8 88.1 80.7 91.6 81 85.5 90.6 82.5 92.8 79.2 87.1 92.9 84.2 90.6 77.5 74.1 89.8 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.2 83.7 79.7 75 76.9 73.8 76.7 68.5 75.5 76.4 73.9 76.7 68.5 75.5 76.4 77.1 74.8 68.3 75.5 76.4 77.1 74.8 68.3 <th>700</th> <th>76.5</th> <th>74.5</th> <th>76.1</th> <th>74.2</th> <th>89</th> <th>65.7</th>	700	76.5	74.5	76.1	74.2	89	65.7
83.7 75 82.1 79.5 74.9 87.1 75.9 84 83.8 77.7 89.7 79.3 84.8 88.1 80.7 91.6 81 85.5 90.6 82.5 92.8 79.2 87.1 92.1 83.2 91.1 76.6 86.9 92.9 84.2 90.6 77.5 74.1 89.8 84.8 85.9 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.3 77.5 74.1 89.8 84.8 76.2 77.5 74.2 86.7 83.7 76.3 76.9 73.7 81 75.3 75.5 76.4 73.9 76.7 68.5 75.5 76.4 73.9 76.7 68.5 75.9 76.7 74.1 74.8 68.3 75.5 76.4 74.1 74.8 68.3 <th>800</th> <th>79.6</th> <th>74.8</th> <th>79.5</th> <th>26.3</th> <th>71.6</th> <th>70.3</th>	800	79.6	74.8	79.5	26.3	71.6	70.3
87.1 75.9 84 83.8 77.7 89.7 79.3 84.8 88.1 80.7 92.8 79.2 87.1 92.1 83.2 91.1 76.6 86.9 92.9 84.8 89.9 76.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.2 77.5 74.2 83.7 79.7 75. 76.9 73.7 81.7 79.7 75. 76.9 73.7 81.5 71.5 75.5 76.4 73.9 76.7 68.5 75.5 76.4 73.9 76.7 68.3 75.5 76.7 74.8 68.3 74.4 75.9 76.7 76.7 76.8 76.7 75.9 76.7 76.7 76.7 76.4	900	83.7	22	82.1	5'62	74.9	74
89.7 79.3 84.8 88.1 80.7 91.6 81 85.5 90.6 82.5 92.8 79.2 87.1 92.9 84.2 91.1 76.6 86.9 92.9 84.8 89.9 76.6 77.1 92.9 84.8 85.9 77.5 74.1 89.8 84.8 76.2 77.5 74.1 89.8 84.8 76.3 77.5 74.2 86.7 83.7 75 76.9 73.7 81 75.3 75 76.9 73.9 76.7 68.5 75.5 76.4 73.9 76.7 68.5 75.5 76.4 74.1 74.8 68.3 75.9 76.7 74.9 68.3 74.1 75.9 76.7 74.8 68.3 74.1 75.9 76.7 74.8 68.3 74.1 75.9 76.7 77.5 77.4 77.4 <th>1000</th> <th>87.1</th> <th>6'5/</th> <th>84</th> <th>83.8</th> <th>7.77</th> <th>8.77</th>	1000	87.1	6'5/	84	83.8	7.77	8.77
91.6 84 85.5 90.6 82.5 92.8 79.2 87.4 92.1 83.2 91.1 76.6 86.9 92.9 84.8 89.9 76.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 85.9 78 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76.7 74.8 68.3 75.9 76.7 74.8 68.3 75.9 76.7 74.8 68.3 75.9 76.7 74.8 68.3	1100	89.7	29.3	84.8	88.1	80.7	80.1
92.8 79.2 87.1 92.1 83.2 91.1 76.6 86.9 92.9 84.8 89.9 76.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 76.2 77.5 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75.5 76.4 73.9 76.7 68.5 75.9 76.7 74.1 74.8 68.3 75.9 76.7 74.1 74.8 68.3 75.9 76.7 74.1 74.8 68.3	1200	91.6	81	85.5	9'06	82.5	82.2
91.1 76.6 86.9 92.9 84.2 89.9 76.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 85.9 78 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.4 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76.7 74.1 74.8 68.3 75.9 75.9 74.1 74.8 68.3 75.9 75.9 75.1 74.1 74.8 68.3	1300	92.8	79.2	1.78	92.1	83.2	84
89.9 76.6 77.1 92.9 84.8 90.6 77.5 74.1 89.8 84.8 85.9 78 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76. 74.1 74.8 68.3 74.9 75.9 75.1 77.1 77.4	1400	91.1	9'92	6'98	92.9	84.2	84.9
90.6 77.5 74.1 89.8 84.8 85.9 78 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76.7 74.1 74.8 68.3 74.9 75.9 75.1 77.1 77.4	1500	89.9	76.6	17.1	92.9	84.8	85.3
85.9 78 74.8 86.7 83.7 76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76 74.1 74.8 68.3 74.9 75.9 75.1 77.4 77.4	1600	90.6	77.5	74.1	8.68	84.8	85.4
76.2 77.5 74.2 83.7 79.7 75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76 74.1 74.8 68.3 74.9 75.9 74.1 73 67.4	1700	85.9	78	74.8	1.98	83.7	84.4
75 76.9 73.7 81 75.3 75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76 74.1 74.8 68.3 74.9 75.9 74.1 73 67.4	1800	76.2	77.5	74.2	2.58	79.7	08
75 76.5 73.8 78.8 71.5 75.5 76.4 73.9 76.7 68.5 75.9 76 74.1 74.8 68.3 74.9 75.9 74.1 73 67.4	1900	75	76.9	73.7	81	75.3	71.8
75.5 76.4 73.9 76.7 68.5 75.9 76 74.1 74.8 68.3 74.9 75.9 74.1 73.8 67.4	2000	75	76.5	73.8	78.8	71.5	8.99
75.9 76 74.1 74.8 68.3 74.9 75.9 74.1 73 67.4	2100	75.5	76.4	8'82	7.97	68.5	99
74.9 75.9 74.1 73 67.4	2200	75.9	92	74.1	74.8	68.3	64
	2300	74.9	75.9	74.1	73		61

VI.4.2 Wind Speed Data (mph)—Conroe

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1.1 0.7 0.09 0.09 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	444 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	255 000 000 000 000 000 000 000 000 000	2.1 3.1 4.1 4.1 0.5 0.9 5 5 5	1.4 1.5 1.5 2.3 2.3 0.6 0.6	4 - 6 4 8 5 8 6	0.02 0.02 0.08 0.08 1.13 1.13 1.13 1.13 1.18 1.18	0.7 0.7 1.8 1.9 1.9 1.9 2.3 2.3 2.3	0.8 0.7 0.9 0.9 0.9 1.7 1.7
13 16 06 56 05 07 06 14 58 08 08 11 08 45 05 15 04 07 46 08 05 06 04 45 07 05 08 05 44 04 09 15 06 23 07 18 18 02 45 13 51 26 38 66 17 5 5 41 5 23 43 41 25 09 11 41 48 22 3 2 57 46 18 07 44 57 45 22 27 26		1.1 1.1 1.1 1.1 1.5 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3				2.1 3.3 3.8 4.1 4.1 2.1 0.0 5 5 5 5 5 1	115 115 125 22 008 006		005 1 1 1 1 1 1 1 1 2 3 3 3 3 3 3 3 3 3 3 3		0.8 0.0 0.3 0.9 0.9 0.9 1.7 1.7
21 07 06 14 58 08 05 08 11 08 45 05 08 15 04 07 46 08 07 05 06 04 45 07 1 05 08 05 44 04 1 09 15 06 23 07 09 18 18 02 45 13 58 5 5 41 5 23 58 41 25 09 11 49 41 48 22 3 2 49 41 48 22 3 25 46 57 46 18 07 44 48 21 45 22 27 26		0.0 0.7 1.1 1.1 1.1 1.5 1.3 3.5 5.6 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4				3.1 3.8 4.1 2.1 0.5 0.9 5 5 5 5 1 5 1	1.5 1.5 2.3 2.5 0.8		0.02 1 1 1 1 1 1 1 1 1 1 1 1 2 3		0.0 0.0 0.0 0.0 0.0 1.7 1.7
05 08 11 08 45 05 08 15 04 45 05 08 07 05 06 04 45 07 08 1 05 08 05 44 04 07 13 09 18 18 02 45 13 13 13 13 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14		0.7 1.1 1.1 1.5 1.3 3.5 5.6 8.4 8.4				3.8 44.1 2.1 2.1 0.0 0.9 6.8 6.8	1.5 2.3 2.5 0.8 0.6		1 0.7 0.8 1 1 1 1 1 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2		0.09 0.09 1.7
08 15 04 07 46 08 07 05 06 04 45 07 1 05 08 05 44 04 1 09 15 06 23 07 09 18 18 02 45 13 51 51 26 38 66 17 58 5 5 41 5 23 49 41 25 09 11 49 41 48 22 3 2 45 45 46 18 07 44 46 57 46 18 07 44 48 21 45 22 27 26		1.1 1.1 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3				4.1 2.1 0.0 5 5 5.1	23 25 0.8 0.6		0.7 1 1 1 1 1 2 2 3 2 3 2 3 2 3 2 3 2 3 2 3		009 009 11.7
07 05 06 04 45 07 1 05 08 05 44 04 1 09 15 06 23 07 09 18 18 02 45 13 51 51 26 38 66 17 58 5 41 5 23 5 49 41 25 09 11 49 41 48 22 3 2 46 57 46 18 07 44 48 21 45 23 25 44 48 21 46 18 07 44		1.1 1.5 1.3 3.5 5.6 5.6 4.8				2.1 0.5 0.9 5 5 5.1	2.5 0.8 0.6		0.8 1.3 2.3 1.8		0.9 0.9 0.9 1.7 1.7
1 0.5 0.8 0.5 4.4 0.4 1 0.9 1.5 0.6 2.3 0.7 0.9 1.8 1.6 0.2 4.5 1.3 5.1 5.1 2.6 3.8 6.6 1.7 5.8 5 5 4.1 5 2.3 5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4.6 5.7 4.6 1.8 0.7 4.4 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6		1.5 1.3 3.5 5.6 5.6 4.8				0.5 0.9 5 5.8	9.0		1.3 2.3 1.2 1.8		00.9
1 0.9 1.5 0.6 2.3 0.7 0.9 1.8 1.8 0.2 4.5 1.3 5.1 5.1 2.6 3.8 6.6 1.7 5.8 5 5 4.1 5 2.3 5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4.0 4.5 2.3 2.8 25 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6		1.5 1.3 3.5 5.6 4.8				5. 5.1 5.1	9.0		1.3		0.9
0.9 1.8 1.8 0.2 4.5 1.3 5.1 5.1 2.6 3.8 6.6 1.7 5.8 5 5 4.1 5 2.3 5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4 3.7 4.5 2.3 2.8 25 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6		1.3 3.5 5.6 4.8		6.2 5.6 4.4		5.1			23 118		1.7
51 56 38 6.6 1.7 58 5 5 4.1 5 2.3 5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4 3.7 4.5 2.3 2.8 25 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6		3.5 5.6 4.8		5.6		6.8 5.1	1.9	5.9	1.8	 	1.7
58 5 5 4.1 5 2.3 5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4 3.7 4.5 2.3 2.8 2.5 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6	3	5.6		4.4	\vdash	5.1	7.3	-	8. 6	-	,
5 4.9 4.1 2.5 0.9 1.1 4.9 4.1 4.8 2.2 3 2 4 3.7 4.5 2.3 2.8 2.5 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6		4.8	-	4.2			7	3.9	00	-	ű
4.9 4.1 4.8 2.2 3 2 4 3.7 4.5 2.3 2.8 2.5 4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6	3.7	֡		7.4		3.9	6.7	1.9	 8.	-	4.
4 37 45 23 28 25 46 57 46 18 0.7 44 48 21 45 22 27 26	3.5	4.9	4	2.2	2.4	2.6	3.8	2.2	2.5	2.9	2
4.6 5.7 4.6 1.8 0.7 4.4 4.8 2.1 4.5 2.2 2.7 2.6	4.1	3.3	5.5	2.1	3.5	3.5	4	2.6	5.2	4.1	1.1
4.8 2.1 4.5 2.2 2.7 2.6	4.9	3.8	3	ဗ	4.3	3	3.5	4	2.7	2.9	1.1
	5.1	7.1	5.2	3.1	4.4	3.4	6.4	4	2.1	2.5	3.5
1500 5.4 0.6 4.9 3.6 1.8 3.7 5.1	9.8	8.9	3.9	4.7	3.9	4.5	5.8	5.4	1.6	2.7	7.1
1600 8.2 1.8 4.1 2.2 2.3 3.7 3.8	3 7.8	8.7	5	3.8	4.3	2.9	7.2	5.7	2.2	2.6	5.2
1700 7.7 0.9 4.5 5.7 3.6 2.6 4.8	8.2	4.1	3.5	4.2	5.1	3.7	6.9	6.1	1.4	2.9	4
1800 7.9 3 7.7 4.3 3.3 1.7 3.8	6.9	3.4	2.4	6.2	7.5	4.8	5.5	4.3	1.5	1.9	4.2
1900 5.2 1.5 6 2.3 4.8 0.9 2.3	3.8	0.7	1.3	4.3	4.1	5.2	4.5	7.2	8.0	1.8	2.9
2000 4.1 1.9 5.4 3.9 2.9 1.7 1.4	2.7	0.7	0.2	9	4.1	5.9	5.8	3.6	1.3	1.2	2.3
2100 3.4 3.4 4.2 5 5.9 1.9 0.8	1.8	0.1	8.0	9.6	5	4.4	5.2	1.1	1.6	0.5	-
2200 3 4.9 2.6 3.6 0.9 0.4 0.6	12	1.2	3.2	3.8	3.3	4	4.2	-	1.1	0.5	0.5
2300 2.5 2.6 0.2 3.9 0.4 0.5 0.8	1	0.9	4.7	3.4	2	2.7	2.6	2.0	1.3	9.0	0.3

VI.4.2 Wind Speed Data (mph)—Conroe

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11-Sep		2.3	£.	1.5	4.	0.9	-	1.2	1.1	1.4	3.5	4.9	3.9	3.9	5.5	4.9	3.1	3.9	6.4	4.4	2.7	2.8	2	1.	1.1
10-Sep		1.4	12	1.2	1.4	1.9	1.4	1.3	1.5	2.8	2.9	3.6	1.6	3.1	3.1	3.6	9.7	8	6.9	3.3	2.1	2.6	3.7	4.8	3
09-Sep		3.7	3.4	2.1	-	1.8	2.4	2.3	1.7	0.9	1.8	2.6	2.4	1.8	3.4	3.5	3.9	5.2	6.5	4.3	4	2.6	2.1	1.5	1.2
08-Sep 09-Sep 10-Sep		3.7	3.9	3.4	3	3.3	3	2.9	3.5	4.8	4.6	5.3	5.4	6.4	4.5	6.5	7.8	7.3	5.7	6.3	4.8	3.7	4.1	4.3	3.9
06-Sep 07-Sep		9.0	0.7	3.3	3.2	2.3	3.2	2.8	3.3	4.4	4.1	6.2	6.7	8.1	9.7	8.5	8.5	7.8	7.9	7.6	5.9	4.1	3.6	3.5	4.1
deS-90		6.4	5	5	3.5	1.8	1.6	2.3	4.3	6.9	5.7	5.1	4.5	5.4	4.8	6.3	5	5.2	5.6	3.4	2.4	3.2	3.6	2.1	1.5
05-Sep		0.4	0.5	9.0	0.5	0.4	0.5	0.7	2.9	2.5	2	2.5	3.2	2.3	6.3	8.7	7.2	7.7	5.5	3.6	2.7	2.8	2.9	2.9	5.5
04-Sep		1.1	3.4	1	6.0	0.9	0.8	1.4	3.3	3.9	3.8	3.3	3.6	5.2	8.2	8.2	6.8	6.1	5.8	2.7	9.0	7.0	6.0	9.0	0.5
03-Sep		2.6	3.7	4.8	4	2.7	2.5	2.6	4.7	7	8.5	7	2.8	4.3	2	0.3	3.3	3.4	1	2.2	1.1	2	1.1	0.5	7.0
02-Sep		2.8	2.1	1.8	3.4	2.6	1.3	1.3	3.6	5.5	5.2	5.2	3.8	4.1	1.2	3.8	0.1	2.3	2.3	3.7	9.0	1.4	4.1	2.4	1.8
01-Sep		3.1	1.7	0.2	0.3	0.9	1.8	2	4.4	7.1	7.6	7.1	5.8	5.3	3.7	4	4.2	10.6	6.3	5.1	2.1	1.6	7.0	0.5	3.3
30-Aug 31-Aug		4	2.7	2.5	6.0	0.5	0.8	1.1	4.1	6.4	5.9	3.8	2.3	2.1	2.7	2.9	5.8	5	4.5	1.5	0.8	0.4	2.4	2.1	3.8
30-Aug		9.5	4.8	Þ	4.1	4.9	4.4	3.5	5.2	6.8	5.8	7	4.8	4.8	4.7	2.9	3.8	2	1.3	0.7	6.0	1.8	3.5	3.5	5.3
29-Aug		2.4	2.1	9.0	9.0	2.0	9.0	0.5	2.7	1.1	5.7	4.1	2.8	0.5	က	1.7	1.8	3.6	6.4	5.3	9.9	4.1	2.8	က	3.8
27-Aug 28-Aug		2	2.0	0.5	5.0	9.0	0.7	0.7	0.5	4.9	5.1	4.8	4.6	3.7	3.2	3.4	3.8	3.8	6.3	6.4	4.1	3.4	4.5	3.8	3.4
27-Aug		1.1	9.0	9.0	0.7	9.0	7.0	0.4	0.3	5	4.8	5	5	9.5	4.2	3.7	3.5	7.8	7.8	5.7	4.5	3.5	3.1	3.2	3.6
26-Aug		0.5	0.9	1	0.5	0.6	0.7	9.0	0.9	5.6	3.2	0.8	2	1.5	3.3	3.3	4	4.7	4.4	5.7	3.9	4.4	4	4	2.3
25-Aug		9.0	1	1.2	9.0	9.0	1.1	1.3	1.3	-	0.4	1.8	-	2.7	3.4	3.5	3.4	4.3	4.9	5.2	5.5	4.8	3	2.5	22
		0	100	200	300	400	200	009	200	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
	T W																								

VI.4.2 Wind Speed Data (mph)—Conroe

	12-Sep	13-Sep	13-Sep 14-Sep	15-Sep	16-Sep	17-Sep
0	0.1	2.5	1.9	7.0	2.8	2.5
100	6.0	3.4	1.9	1.1	2.4	2.9
200	1.1	4.3	1.8	0.9	3.3	2.5
300	1	4.6	1.7	0.5	3.6	2.6
400	0.8	4.3	2.2	0.5	3	3.1
200	1.3	5	0.9	0.5	3.4	3.1
009	1.2	4.3	1.3	1	3.9	2.8
200	1.5	6.3	2	1.9	6.3	4
800	2	4.4	1.9	2	7.5	9
006	1.5	2.3	1.2	2.2	1.7	9.5
1000	1.1	2.4	1.6	2.1	6.7	4.2
1100	1.7	2.1	1.5	1.5	5.9	3.8
1200	2.4	1.4	1.5	3.8	2.9	3.5
1300	2.8	4.4	1.2	3.4	7.2	3.8
1400	4.9	1.5	3.7	3	9.9	3.8
1500	4.5	9.0	2.3	8.6	9.9	4.8
1600	3.3	1.5	2.7	2.9	2.5	4.5
1700	5.9	1.7	4.8	6.4	3.9	3.4
1800	11.2	1.4	9	4.7	1.9	1.2
1900	6.9	2.5	1.8	3.1	1.5	2.0
2000	2.6	2.4	0.6	3.1	1.1	7.0
2100	9.0	1.4	1.5	3	1.4	8.0
2200	0.8	6.0	1.1	3.1	2	2.0
2300	1.5	1.2	1.2	2.9	2.9	2.0

VI.4.3 Wind Direction (0-359 degrees)—Conroe

	07-Aug	07-Aug 08-Aug	09-Aug	10-Aug	11-Aug	09-Aug 10-Aug 11-Aug 12-Aug 13-Aug 14-Aug 15-Aug 16-Aug 17-Aug 18-Aug 19-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	20-Aug 21-Aug 22-Aug 23-Aug	23-Aug	24-Aug
IME																		
-	138	140	179	315	237	33	317	320	110	323	236	204	240	204	182	88	141	49
100	177	8	356	271	239	61	28	22	84	280	231	210	267	218	245	317	48	04
200	116	346	348	284	254	41	o	352	41	5	231	304	240	228	282	347	22	31
300	89	38	ಜ	318	265	80	319	355	13	283	233	42	256	228	1	311	19	15
400	13	42	338	320	265	327	49	9	20	270	262	338	273	238	317	338	45	341
200	346	51	338	358	263	351	351	16	23	344	261	345	276	293	323	358	43	9
009	93	83	23	20	276	28	21	41	40	40	260	358	302	24	340	12	24	327
200	124	117	25	227	273	100	49	65	100	257	257	244	259	246	6/7	19	70	72
800	180	98	149	227	258	139	99	105	158	247	263	249	240	246	258	338	74	112
906	186	179	182	228	263	141	62	131	181	246	273	225	224	233	258	101	76	154
1000	184	192	149	207	245	88	72	114	187	216	251	205	228	224	300	1.1	150	247
1100	177	162	88	220	88	99	ន	107	189	222	192	162	183	220	126	183	195	271
1200	69	124	157	239	79	87	£	104	172	225	126	193	181	170	155	156	111	43
1300	179	114	184	106	97	88	47	131	160	218	217	190	198	153	129	347	17	32
1400	170	104	158	141	75	88	99	130	161	220	182	165	169	184	91	35	98	101
1500	173	113	157	160	88	98	25	151	175	233	154	171	149	193	154	73	125	120
1600	161	130	158	165	228	82	75	145	167	223	153	156	134	191	141	124	121	119
1700	153	139	138	139	163	11	28	144	202	258	158	145	135	176	141	98	141	139
1800	151	208	162	174	160	1 00	114	149	278	276	152	152	143	165	137	105	142	156
1900	147	147	154	195	8	69	115	143	297	258	148	145	156	139	154	93	153	152
2000	144	157	155	174	250	141	105	133	280	156	156	148	167	160	139	73	207	176
2400	150	154	163	8	251	148	88	136	37	118	173	167	176	165	62	120	77	148
2200	157	174	8	219	366	319	1	33	239	228	187	178	189	165	69	85	11	28
2300	174	175	168	236	101	10	358	100	268	233	195	130	196	181	11	108	354	88

VI.4.3 Wind Direction (0-359 degrees)—Conroe

	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	41	201	147	195	225	235	265	263	157	238	251	356	83	350	95	75	79	145
100	347	269	349	210	235	236	267	222	200	243	257	338	92	10	8	71	11	166
200	34	285	345	30	226	235	273	165	238	556	289	349	72	75	99	99	1	145
300	345	343	305	353	356	260	274	47	265	266	290	343	25	78	59	333	25	144
400	28	76	4	351	359	266	299	285	269	263	258	331	27	28	54	48	22	77
200	54	286	341	327	325	266	271	260	223	269	269	350	5	54	45	64	61	40
009	62	21	353	32	269	270	226	366	226	259	278	36	30	32	46	64	20	87
700	88	239	204	146	239	268	366	272	222	257	251	37	48	59	33	120	100	35
800	160	244	226	205	243	260	276	272	241	366	286	41	61	76	43	181	164	139
900	105	235	204	212	229	262	270	265	249	366	307	353	69	78	46	158	151	211
1000	88	219	197	203	238	251	273	261	237	259	342	316	99	ಟ	46	174	215	191
1100	135	183	196	177	235	250	281	254	242	243	43	42	71	46	95	135	138	161
1200	140	153	161	188	155	235	270	247	267	237	46	17	64	99	25	141	171	83
1300	147	167	192	130	79	211	213	230	342	218	59	52	64	61	69	162	175	78
1400	153	148	158	172	193	187	176	294	228	169	25	28	62	99	80	139	174	82
1500	127	142	127	127	136	233	236	297	125	227	88	48	49	90	80	115	144	92
1600	133	140	161	123	154	194	247	73	302	227	20	99	25	59	80	130	147	138
1700	146	136	150	149	177	213	253	161	334	335	25	51	ន	75	82	141	151	152
1800	151	149	141	147	154	25	285	216	245	283	88	47	99	82	98	136	141	141
1900	160	145	139	141	160	108	32	189	335	43	116	43	36	88	94	129	130	132
2000	164	147	143	140	173	203	130	359	223	43	8	45	20	92	85	123	126	134
2400	155	150	144	159	172	220	237	53	222	243	42	44	89	93	20	111	144	124
2200	152	174	152	159	193	241	292	257	243	14	332	37	99	83	73	118	153	111
2300	159	188	183	136	215	244	261	153	239	309	315	25	37	73	62	100	155	113

VI.4.3 Wind Direction (0-359 degrees)—Conroe

		12-Sep	12-Sep 13-Sep 14-Sep 15-Sep 16-Sep 17-Sep	14-Sep	15-Sep	16-Sep	17-Sep
184 43 47 299 113 59 356 309 113 59 356 309 113 57 9 314 126 60 37 354 103 63 21 7 49 58 19 341 103 63 10 341 103 63 27 350 103 61 13 26 103 61 13 26 103 61 13 26 104 89 172 350 105 61 157 360 89 172 157 360 97 69 246 54 61 28 261 52 61 28 261 52 61 28 28 54 30 50 250 57 40 52 36 57 40 56 36 57	FIME						
85 47 14 282 113 59 356 309 113 57 9 314 126 60 37 354 102 60 37 354 103 63 21 7 49 58 19 341 89 58 67 360 71 60 83 10 127 55 74 320 103 61 13 26 103 61 13 26 103 61 157 360 104 73 256 52 61 28 261 52 61 28 261 52 61 28 261 52 61 28 261 52 54 28 28 54 61 75 285 63 61 75 285 63 61 75 285 63 62 36 301 44 68 36 37 44 68 36 37 44 68 36	0	184	43	47	299	41	37
113 59 356 309 113 57 9 314 126 60 37 354 103 63 21 7 49 58 19 341 89 58 67 360 171 60 83 10 103 61 13 26 104 77 55 74 320 103 61 13 26 363 103 61 157 360 36 112 268 56 31 37 89 172 157 360 36 97 69 246 54 52 61 28 261 52 61 54 28 266 57 61 54 28 28 56 57 61 75 28 56 57 701 75 28 56 57 80 50 50 57	100	85	47	14	282	35	43
113 57 9 314 126 60 37 354 103 63 21 7 49 58 19 341 89 58 67 360 103 61 13 26 103 61 13 26 103 61 13 26 89 172 157 360 114 89 321 45 89 172 157 360 97 69 246 54 61 28 266 52 61 28 261 52 61 28 261 52 61 28 261 52 61 28 28 54 30 50 250 57 44 75 285 63 48 36 37 44 58 37 44 58 37 37 37 37	200	113	59	356	309	36	41
126 60 37 354 103 63 21 7 49 58 19 341 89 58 67 360 71 60 83 10 127 55 74 320 198 71 52 353 103 61 13 26 353 104 172 157 360 36 89 172 157 360 31 97 69 246 54 54 61 28 266 52 65 61 28 261 52 65 54 28 265 57 65 61 75 286 57 67 191 75 285 63 7 222 36 301 44 7 28 35 317 35 317 35	300	113	57	6	314	45	35
49 58 19 341 89 58 67 360 71 60 83 10 127 55 74 320 198 71 52 353 103 61 13 26 114 89 321 45 89 172 157 360 112 268 56 31 97 69 246 54 61 28 261 52 61 28 261 52 54 28 28 54 54 28 28 54 61 28 261 52 61 28 26 57 191 75 285 63 222 36 301 44 223 31 35 31	400	126	60	37	354	35	33
48 58 19 341 89 58 67 360 71 60 83 10 127 55 74 320 198 71 52 353 103 61 13 26 89 172 157 360 112 268 321 45 89 172 157 360 61 73 256 52 61 73 256 52 61 28 261 52 61 28 261 52 54 28 260 57 191 75 286 63 222 36 301 44 223 36 301 44 28 36 37 35 30 35 317 35	200	103	63	21	7	41	43
89 58 67 360 71 60 83 10 127 55 74 320 198 71 52 353 103 61 13 26 114 89 321 45 89 172 157 360 97 69 246 54 61 28 266 52 61 28 261 52 54 28 261 52 61 28 261 52 61 28 260 57 30 50 250 57 191 75 285 63 222 36 301 44 28 35 317 35	009	49	58	19	341	55	39
71 60 83 10 127 55 74 320 198 71 52 353 103 61 13 26 114 89 321 45 89 172 157 360 120 122 31 22 97 69 246 54 6 61 28 261 52 6 61 28 261 52 6 54 28 28 54 6 30 50 250 57 6 491 75 285 63 7 222 36 301 44 7 58 35 317 35	700	88	58	29	360	58	53
127 55 74 320 198 71 52 353 103 61 13 26 114 89 321 45 89 172 157 360 112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 261 52 30 50 250 57 191 75 285 63 222 36 317 35 58 35 31 35	800	71	90	83	10	83	70
198 71 52 353 103 61 13 26 114 89 321 45 89 172 157 360 120 122 31 22 97 69 246 54 61 61 73 256 52 62 61 28 261 52 63 54 28 260 57 63 191 75 285 63 63 222 36 301 44 64 58 35 317 35 31	900	127	55	74	320	99	70
103 61 13 26 114 89 321 45 89 172 157 360 120 122 31 22 112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 283 54 30 50 250 57 191 75 285 63 222 36 301 44 58 35 317 35	1000	198	7.1	52	353	61	74
114 89 321 45 89 172 157 360 120 122 31 22 112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 293 54 30 50 250 57 191 75 285 63 222 36 301 44 58 35 317 35	1100	103	61	13	26	62	73
89 172 157 360 120 122 31 22 112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 293 54 30 50 250 57 191 75 285 63 222 36 337 34 58 35 317 35	1200	114	83	321	45	53	29
120 122 31 22 112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 293 54 30 50 250 57 191 75 285 63 222 36 317 35 58 35 317 35	1300	88	172	157	360	57	41
112 268 56 31 97 69 246 54 61 73 256 52 61 28 261 52 54 28 293 54 30 50 250 57 191 75 285 63 222 36 377 35 58 35 317 35	1400	120	122	31	22	20	45
97 69 246 54 61 73 256 52 61 28 261 52 30 50 250 57 191 75 285 63 222 36 37 35 58 35 317 35	1500	112	268	56	31	52	59
61 73 256 52 52 54 54 55 55 55 55 55 55 55 55 55 55 55	1600	97	69	246	54	53	55
64 28 261 52 30 50 250 57 191 75 285 63 58 35 317 35	1700	9	73	256	52	39	46
54 28 293 54 30 50 250 57 191 75 285 63 222 36 301 44 58 35 317 35	1800	6	28	261	52	8	353
30 50 250 57 191 75 285 63 222 36 301 44 58 35 317 35	1900	54	28	293	54	9	326
191 75 285 63 222 36 301 44 58 35 317 35	2000	99	20	250	57	25	343
222 36 301 44 58 35 317 35	2100	191	75	285	63	12	360
58 35 317 35	2200	222	36	301	44	24	329
20 00	2300	58	35	317	35	43	319

VI.4.4 Ozone (ppb)—Conroe

9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 2 1 2 1	: 31	g 08-Au	07-Aug 08-Aug 09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	10-Aug 11-Aug 12-Aug 13-Aug 14-Aug 15-Aug 16-Aug 17-Aug 18-Aug 19-Aug 20-Aug 21-Aug 22-Aug 23-Aug 24-Aug	23-Aug	24-Aug
1 0 15 17 16 38 9 0 12 14 15 26 11 27 SPAN 0 14 14 SPN 29 7 SPN 11 9 15 SPN 6 22 SPAN 0 14 14 SPN 26 3 SPN 17 9 15 SPN 6 22 17 SPN 6 20 17 17 18 17 SPN 6 20 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 18 17 18 18 17 18 18 18 17 18 18 18 18																		
SPAN 0 14 14 SPN 29 7 SPN 11 9 15 SPN 6 2 2 17 SPN 6 2 2 17 SPN 6 2 2 17 SPN 6 2 2 2 2 17 SPN 6 2 2 2 17 SPN 6 2 2 2 17 SPN 2 17 SPN 17 17 17 17 17 18 2 17 18 2 17 18 2 17 18 2 17 18 2 17 18 2 17 18 2 17 18 2 17 18 18 2 17 18 2 17 2 17 4 18 2 17 4 18 2 17 4 18 18 2 17 4 18 18	9	6	-	0	15	17	16	98	9	0	12	14	15	26	11	27	12	8
SPAN 0 11 12 SPN 26 3 SPN 8 5 17 SPN 2 17 18 2 17 18 2 17 18 2 17 18 2 17 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 18 2 2 19 3 19 3 19 3 19 3 19 3 19 3 19 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4	2	SPAN	0	14	14	SPN	29	7	SPN	11	6	15	SPN	6	22	N _S	9
0 0 9 5 15 24 1 0 6 2 27 18 23 12 12 0 0 10 1 15 22 0 0 3 0 18 23 1 5 12 0 0 1 14 0 0 3 0 18 23 1 5 12 1 0 1 1 14 0 0 3 13 1 23 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		3	SPAN	0	11	12	SPN	26	3	SPN	8	5	21	SPN	2	17	SPN	4
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0	2	0	0	6	5	15	24	1	0	9	2	27	18	2	12	9	2
0 0 9 10 14 0 0 1 0 4 4 0 9 9 10 14 0 0 1 12 12 0 4 5 7 15 20 36 37 8 7 8 7 29 18 6 17 4 17 20 21 32 25 21 15 23 64 31 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 <th>0</th> <td>-</td> <td>0</td> <td>0</td> <td>10</td> <td>1</td> <td>15</td> <td>22</td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> <td>18</td> <td>23</td> <td>1</td> <td>5</td> <td>10</td> <td>1</td>	0	-	0	0	10	1	15	22	0	0	3	0	18	23	1	5	10	1
0 0 9 1 3 0 9 3 1 4 5 7 15 20 36 37 8 7 8 7 39 18 7 9 34 17 4 17 30 48 7 40 5 64 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 <th>0</th> <td>0</td> <td>0</td> <td>0</td> <td>6</td> <td>0</td> <td>10</td> <td>14</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>13</td> <td>12</td> <td>0</td> <td>4</td> <td>10</td> <td>1</td>	0	0	0	0	6	0	10	14	0	0	1	0	13	12	0	4	10	1
5 7 15 30 36 37 8 7 8 7 9 18 5 17 17 20 21 33 52 36 37 61 36 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 34 35 54 40 52 65 66 66 67 34 36 52 64 67 64 67 64 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47 47	0	4	0	0	6	2	19	23	2	0	3	0	6	3	-	4	7	2
17 20 21 33 52 38 25 11 15 24 34 34 34 34 34 34 35 35 35 35 35 35 35 35 35 35 35 36 37 36 37 36 37 36 37 36 37 36 37 36 37 37 37 37 37 37 37 37 38 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37<	2	10	5	2	15	20	36	37	8	7	8	7	29	18	5	17	13	15
25 29 30 59 69 34 31 23 25 37 60 37 30 48 34 37 42 70 32 41 25 40 52 65 65 39 39 57 49 44 54 80 69 37 64 67 67 69 47 71 43 67 67 77 53 64 75 69 CAL 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 <th>12</th> <td>20</td> <td>17</td> <td>20</td> <td>21</td> <td>33</td> <td>52</td> <td>38</td> <td>22</td> <td>21</td> <td>15</td> <td>23</td> <td>54</td> <td>34</td> <td>24</td> <td>35</td> <td>25</td> <td>32</td>	12	20	17	20	21	33	52	38	22	21	15	23	54	34	24	35	25	32
34 37 42 78 70 32 41 25 40 52 65 65 39 39 57 49 44 54 80 69 33 55 CAL 53 67 69 42 53 67 67 69 42 53 67 67 69 47 61 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67<	19	23	25	23	30	58	69	34	31	23	25	37	90	37	30	48	88	45
49 44 54 80 89 33 55 CAL 63 67 69 42 53 67 69 74 69 74 69 74 69 74 69 74 69 69 69 69 74 71 43 67 67 67 67 74 77 47 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77 77	29	34	34	37	42	78	7.0	32	41	25	40	25	99	33	39	25	40	54
70 53 64 60 37 69 CAL 60 74 71 43 62 61 77 59 64 75 58 39 71 CAL 67 86 77 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67	45	47	49	44	54	80	69	33	55	CAL	53	29	69	42	53	99	44	61
77 59 64 75 58 39 71 CAL 67 66 76 43 71 CAL 67 66 76 43 71 61 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 67 6	89	9	70	53	63	84	99	37	69	CAL	09	74	11	43	62	61	43	89
76 61 63 66 69 40 81 39 71 99 82 55 65 40 93 61 65 64 63 44 79 41 76 116 93 63 64 41 412 83 61 66 65 44 79 41 76 130 114 75 66 49 445 84 79 40 40 85 40 114 75 70 46 49 45 111 59 53 74 22 27 76 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 77 76 77 77 77 77 77 77 77 78 74 74 78 77 78 74 74	95	99	11	59	64	75	28	33	71	CAL	29	98	76	47	63	47	41	99
87 61 65 64 62 43 87 42 72 116 93 63 64 41 73 41 76 128 106 72 66 49 41 76 128 106 72 66 49 40 48 40 85 130 114 75 50 48 49 40 48 40 85 130 114 75 50 48 40 48 40 48 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	105	41	92	61	63	99	59	40	81	39	71	88	82	55	65	40	45	61
93 61 66 65 44 79 41 76 128 108 70 68 69 68 64 68 40 85 130 114 75 66 49 96 94 63 60 72 31 28 37 119 117 124 89 80 41 45 111 59 53 74 22 27 76 76 78 79 79 21 26 84 49 76 18 13 77 51 49 77 37 39 12 12 36 47 46 65 13 4 13 35 39 44 24 32 30 6 18 38 35 49 10 0 9 26 33 37 19 32 33 2 15 28 24 36 <th>8</th> <td>34</td> <td>87</td> <td>61</td> <td>92</td> <td>64</td> <td>62</td> <td>43</td> <td>87</td> <td>42</td> <td>72</td> <td>116</td> <td>93</td> <td>63</td> <td>64</td> <td>41</td> <td>51</td> <td>64</td>	8	34	87	61	92	64	62	43	87	42	72	116	93	63	64	41	51	64
112 66 64 68 40 48 40 85 119 114 75 70 46 96 94 63 60 72 31 28 37 119 117 124 89 80 41 45 114 53 53 74 22 21 77 76 74 94 79 59 21 26 84 49 46 76 18 13 17 51 49 57 37 39 12 12 36 47 46 65 13 4 13 35 39 44 24 32 30 6 18 38 39 10 9 26 33 37 19 32 33 2 15 28 24 39 1 15 30 16	25	30	93	61	99	99	65	4	79	41	76	128	106	72	99	49	48	55
45 141 59 60 72 31 28 37 119 117 124 89 80 41 45 141 59 53 74 22 21 27 76 74 94 79 59 21 26 84 49 44 76 18 17 51 49 57 37 39 12 12 36 47 46 65 13 4 13 35 39 44 24 32 30 6 18 38 35 49 10 0 9 26 33 37 19 32 33 2 15 28 24 36 1 15 18 34 15 30 16	£	23	112	80	89	64	88	40	48	40	85	130	114	75	02	46	48	54
45 111 59 53 74 22 27 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 77 77 77 77 77 77 77 77 73 73 73 71 78 77 78 77 78 77 78 77 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78 78	8	23	ક્ક	94	63	90	72	31	28	37	119	117	124	89	08	41	43	50
26 84 49 44 75 18 13 17 51 49 57 37 39 12 12 36 47 46 65 13 4 13 35 39 44 24 32 30 6 18 38 35 49 10 0 9 26 33 37 19 32 23 2 15 28 24 39 9 1 15 18 24 34 15 30 16	88	12	45	111	59	સ	74	22	71	27	76	74	94	79	59	21	33	39
12 36 47 46 65 13 4 13 35 39 44 24 32 30 6 18 38 35 49 10 0 9 26 33 37 19 32 23 2 15 28 24 39 9 1 15 18 24 34 15 30 16	g	2	92	8	49	44	75	18	13	17	51	49	57	37	39	12	18	32
6 18 38 35 49 10 0 9 26 33 37 19 32 23 2 15 28 24 39 9 1 15 18 24 34 15 30 16	73	9	12	36	47	46	65	13	4	13	35	33	44	24	32	30	14	22
2 15 28 24 39 9 1 15 18 24 34 15 30 16	12	9	9	18	38	35	49	10	0	6	26	33	37	19	32	23	10	12
	14	က	2	15	78	24	38	6	1	15	18	24	34	15	OE	16	8	9

VI.4.4 Ozone (ppb)—Conroe

VI.4.4 Ozone (ppb)—Conroe

17-Sep		37	SPN	SPN	38	88	33	36	41	46	51	55	27	59	62	62	62	62	61	45	35	25	23	34	
ep 17		. ,	S	S															_						L
16-Sep		36	34	31	35	34	32	33	38	43	49	55	58	59	59	9	62	63	61	44	33	33	31	33	1
15-Sep		3	ε	1	+	ı	4	5	8	6	16	53	49	19	63	89	74	98	08	89	53	54	47	44	!
14-Sep		2	1	0	0	2	1	0	9	15	20	24	24	27	29	28	24	20	7	8	6	9	2	2	,
12-Sep 13-Sep 14-Sep 15-Sep		15	NdS	NdS	12	12	11	10	11	12	12	13	22	56	24	18	10	17	15	7	5	5	ဗ	1	Ĺ
12-Sep		0	0	0	0	0	0	0	4	12	25	36	47	55	54	33	38	38	36	37	37	28	25	21	,
		0	100	200	300	400	200	009	200	800	006	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2000
	TIME			, ,		,	~		-	-		1	1	1	-	1	1	1	-	-	•	2	2	2	ſ

VI.4.5 Particulate Matter (µg/m³)—Conroe

07-Aug 08-Aug	5	39-Aug	10-Aug	11-Aug	12-Aug	3-Aug	14-Aug	15-Aug 16-Aug	16-Aug	17-Aug	18-Aug 19-Aug	19-Aug	20-Aug	21-Aug	22-Aug 23-Aug	23-Aug	24-Aug
29 7.34 5.69	5	_	14	8.74	13.32	15.2	21.72	12.29	7.75	19.89	18.04	28.23	18.87	5.7	11.71	13.35	9.48
.88 4.75 3.06	_	(0)	13.5	7.63	13.71	16.41	21.65	10.29	8.02	20.85	17.74	25.36	22.53	6.7	13.38	13.66	9.9
2.75 5.76 1.53	-		14.07	7.83	12.92	16.41	22.07	9.51	6.14	20.21	15.02	26.47	18.51	5.91	10.67	14.55	10.41
2.45 6.4 0.14	0.14	-	11.68	6.75	12.82	17.42	23.25	8.62	6.62	19.04	12.9	20.47	24.32	5.64	11.61	14.02	8.8
4.28 7.15 1.28		00	9.44	99'9	11.82	16.51	23.6	9.18	6.93	18.51	12.66	17.92	16.36	6.51	12.83	15.92	9.81
3.15 8.09 2.73	-	6	9.2	29'9	11.84	15.93	25.49	9.54	5.49	19.64	11.92	18.88	14.83	7.5	14.11	13.81	10.77
22.54 21.34 18.91	_	듄	13.67	8.03	15.74	16.55	28.85	12.38	10.6	21.16	17.15	24.6	20.42	10.86	19.57	17.11	20.35
25.24 14.61 24	\vdash	24.04	17.02	7.53	16.31	15.61	30.35	12.7	19	22.23	27.54	27.19	27.86	20.87	25.68	23.18	19
4.03 6.7 12.68	12.	88	9.39	90:9	17.11	20.27	10.41	3.29	13.16	20.12	18.34	14.53	14.67	11.24	21.64	24.85	14.23
7.62 3.33 5.17		7	6.13	11.75	17.55	20.72	4.87	4.98	13.44	20.84	15.27	22.08	8.72	5.87	16.27	15.49	7.87
14.13 9.12 6.09		9	7.99	15.69	12.01	8.24	2.1	7.45	13.37	16.06	14.84	16.97	6.19	5.55	18.75	6.97	6.33
31.09 7.25 7.71		7	6.88	14.77	8.28	7.72	0.14	10.72	13.51	15.08	15.89	14.16	4.72	96.3	19.04	7.1	7
24.04 9.29 17.		17.98	7.14	17.11	12.49	4.39	2.58	11.97	10.77	15.73	15.82	10.4	90'9	9.59	8.45	10.39	6.3
23.57 9.63 17.		17.14	7.27	17.27	12.72	5.48	2.65	12.15	12.15	16.03	16.37	15.79	5.91	14.91	12.3	3.47	6.03
21.97 15.07 17.67		29	8.94	15.27	9.75	3.48	3.43	17.23	10.95	15.85	18.22	14.88	4.38	12.9	12.08	6.32	14.66
18.93 8.22 18	-	18.4	7.52	15.3	7.54	6.3	3.72	22.07	11.85	17.71	23.84	15.16	7.97	14.15	16.8	12.27	10.8
13 8.38 19		19.54	9.65	14.6	9.78	6.78	4.33	22.11	11.62	15.66	23.15	22.25	12.51	16.94	14.25	12.24	2.14
13.61 7.83 23		23.86	11.04	17.79	11.2	7.59	3.12	16.06	9.29	19.07	24.29	21.05	15.58	11.62	5.35	5.62	2.89
.98 1.8 21		8	15.13	21.74	13.95	19.95	7.57	10.55	9.46	21.66	28.71	38.25	26.34	30.51	14.65	9.06	4.97
17 9.41 17.	\dashv	17.78	22.32	15.02	12.5	16.13	13.71	10.96	10.92	19.63	28.97	33.84	32.27	18.57	11.42	7.05	4.01
16.46 6.58 18.	-	4	27.65	13.27	17.5	19.36	17.09	12.11	14.64	28.89	28.98	26.42	15.04	8.11	14.29	9.1	3.63
11.14 7.11 17		17.75	20.9	9.14	16.21	20.23	14.58	11.39	21.43	21.05	26.99	25.52	7.2	10.33	16	9.56	5.24
10.98 2.08 16		16.55	13.68	13.04	14.2	23.02	12.91	11.94	23.68	20.38	29.74	23.67	5.94	9.57	14.86	8.99	3.12
12.78 5.39 15.77		11	11.52	12.85	15.14	21.09	12.26	9.97	19.05	19.25	29.16	21.73	6.54	11.85	17.99	9.42	3.57
		ı															

VI.4.5 Particulate Matter (µg/m³)—Conroe

The same of the sa	25-Aug	26-Aug	27-Aug	28-Aug	28-Aug 29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep 04-Sep		05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	3.75	38.8	3.31	5.96	6.9	3.79	0.49	17.33	21.2	16.03	LIM	CIM	10.15	26.42	7.78	2.79	7.63	10.64
100	2.45	4.27	4.48	3.44	6.22	3.12	3.07	16.28	19.52	16.86	LIM	LIM LIM	9.38	28.37	8.03	3.17	8.71	11.84
200	6.43	2.82	2.77	2.71	2.54	2.41	92.0	15.66	18.98	89.8	LIM		10.64	30.63	8.38	1.43	8.21	11.88
300	3.76	1.88	3.78	3.72	-0.12	99.0	2.79	14.82	17.46	6.77	LIM	LiM	12.74	30.41	8.08	9.0	8.01	11.64
400	5.38	1.62	4.32	1.03	1.6	1.1	3.38	15.86	15.13	4.63	E	LM	12.83	25.75	8.34	1.3	8.79	11.27
200	3.63	3.32	3.7	2.9	1.7	2.14	98'5	12.86	13.12	4.02	LIM	LIM	15.12	24.27	9.11	1.16	8.55	12.21
009	8.11	10.71	13.38	11.8	12.16	5.99	11.31	17.84	15.27	5.66	LIM	LIM	20.51	18.62	9.46	2.26	12.73	14.1
200	14.8	16.13	24.59	21.71	26.12	1.92	5.3	15.71	22.4	3.93	LIM	LIM	24.09	18.06	10.02	3.69	15.47	17.18
800	7.91	90'9	7.43	6.01	7.76	0.8	5.69	12.1	9.47	3.1	4.07	LIM	25.8	11.49	12.85	5.72	9.54	15.29
900	1.15	2.62	4.95	6.46	2.62	1.91	3.79	15.37	11.18	9.7	11.02	LIM	27.76	28.45	13.87	5.95	6.26	4.58
1000	1.84	2.42	1.3	3.45	2.52	1.16	11.5	10.93	9.65	10.38	12.42	11.55	26.44	9.94	13.61	4.55	3.41	2.82
1100	1.64	1.26	2.64	10.75	5.91	1.67	7.29	9.29	3.85	9.66	6.62	LIM	24.85	3.22	14.44	3.35	4.04	7.6
1200	1.72	1.89	3.14	5.52	1.7	1.09	8.01	737	8.53	7.07	12.21	AGI	22.71	2.21	13.51	2.6	3.71	13.93
1300	1.91	2.71	9.55	8.11	3.7	1.31	9.74	10.68	6.54	10.5	12.77	AGI	25.22	1.38	8.93	3.66	4.68	6.45
1400	4.92	2.85	8.46	9.85	2.32	4.3	10.99	15.05	9.39	9.21	11.13	19.03	26.38	1.23	5.49	6.5	5.76	5.76
1500	3.93	10.62	4.52	14.34	6.08	3.69	10.23	9.56	12.95	10.62	13.32	18.85	25.49	2.6	8.32	8.01	15.44	4.66
1600	3.83	20.63	17.62	24.35	7.63	4.42	8.71	30.39	10.48	14.3	13.04	19.95	24.85	0.95	4.73	19.96	12.63	2.57
1700	5.34	23.37	18.39	22.29	8.92	6.38	11.52	6.83	13.67	10.04	13.87	16.09	23.36	3.15	7	6.41	6.74	3.39
1800	2.61	18.2	8.1	12.09	33.82	4.67	13.84	21.73	22.63	19.86	17.71	15.85	23.38	3.69	7.35	9.13	2.76	6.09
1900	8.38	20.03	8.04	9.1	33.14	10.51	15.26	16.93	17.48	17.3	19.1	19.58	24.63	16.54	99.0	10.27	11.78	7.28
2000	9.23	9.28	4.78	12.73	25.86	15.88	16.02	15.55	18.51	18.86	LIM	20.63	25.75	15.69	2.6	8.57	17	6.64
2100	11.41	8.58	2.94	13.41	13	26.92	17.91	18.26	14.68	25.3	E L	26.98	23.22	10.16	3.12	9.54	14.61	6.38
2200	8.81	7.51	4.77	13.46	9.43	18.09	17.05	18.2	13.07	38.37	LIM	33.74	23.68	6.51	3.53	8.14	11.83	3.73
2300	6.72	6.45	5.91	11.24	3.19	7.82	21.04	22.43	13.64	LIM	MIT	20.91	25.86	6.1	2.96	7.84	10.5	3.66

VI.4.5 Particulate Matter (µg/m³)—Conroe

2.14 0.89 2.89 1.71 4.74 2.4 4.34 3.08 4.32 4.08 6.22 4.48 7.6 4.54 11.2 5.45 11.2 5.45 12.24 3.99 8.71 7.11 8.71 7.11 8.71 7.11 8.72 7.85 8.73 8.27 12.84 8.27 1.87 4.55 2.75 5.42 2.94 3.49	6.27			
2.14 0.89 2.89 1.71 4.74 2.4 4.34 3.08 4.32 4.08 6.22 4.48 7.6 4.54 11.2 5.45 12.24 3.99 8.71 7.11 8.71 7.11 8.71 7.11 8.72 4.55 1.87 4.55 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	6.27			
2.89 1.71 4.74 2.4 4.34 3.08 4.32 4.08 6.22 4.48 7.6 4.54 11.2 5.45 12.24 3.99 12.24 3.99 12.24 3.99 12.24 3.99 12.24 3.99 12.24 3.99 1.87 4.55 1.87 4.55 1.87 4.55 1.87 4.55 1.87 2.99 2.94 3.49		5.24	14.78	9.62
4.74 2.4 4.34 3.08 4.32 4.08 6.22 4.48 7.6 4.54 11.2 5.45 7.95 6.71 7.95 6.71 7.95 6.71 7.95 6.71 7.95 6.71 7.95 8.71 7.69 3.66 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	3.17	4.54	13.23	7.99
4.34 3.08 4.32 4.08 6.22 4.48 7.6 4.54 11.2 5.45 11.2 5.45 7.95 6.71 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	3.26	2.69	10.15	8.14
4.32 4.08 6.22 4.48 7.6 4.54 12.47 4.6 11.2 5.45 7.95 6.71 5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	4.89	2.34	6.57	7.3
6.22 4.48 7.6 4.54 12.47 4.6 11.2 5.45 7.95 6.71 5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	4.36	1.08	7.21	8.66
7.6 4.54 12.47 4.6 11.2 5.45 7.95 6.71 5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 8.27 1.87 4.55 1.87 4.55 -0.05 2.42 2.94 3.49	4.24	2.51	6.62	7.58
12.47 4.6 11.2 5.45 7.95 6.71 5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	7.43	4.79	8.04	11.15
11.2 5.45 7.95 6.71 5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	10.27	5.82	8.03	12.51
5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	8.71	6.5	5.87	8.19
5.21 9.22 9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	8.14	4.76	7.56	8.89
9.92 4.74 12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	4.12	3.12	6.12	5.96
12.24 3.99 8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	5.62	5.71	2.31	3.61
8.71 7.11 7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	3.69	10.08	5.2	3.81
7.69 3.66 4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	2.76	5.69	3.66	3.95
4.69 8.27 1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	3.59	10.11	2.13	4.95
1.87 4.55 2.75 5.42 -0.05 2.42 2.94 3.49	5.66	13	2.7	3.83
2.75 5.42 -0.05 2.42 2.94 3.49	3.91	15.23	6.54	5.36
-0.05 2.42 2.94 3.49	5.12	18.3	6.39	3.5
2.94 3.49	5.17	16.89	7.71	4.93
	4.2	19.79	11.43	5.03
2000 3.62 3.07 5.17	5.17	20.36	8.68	11.87
2100 2.34 3.29 5.09	5.09	19.31	11.33	17.1
2200 2.06 5.28 4.11	4.11	7.91	10.18	12.16
2300 1.77 5.98 5.5	5.5 16	.35	9.25	11.12

VI.5 TNRCC DATA--GALVESTON

- VI.5.1 Temperature Data (°F)--Galveston
- VI.5.2 Wind Speed Data (mph)-Galveston
- VI.5.3 Wind Direction (0-359 degrees)--Galveston
- VI.5.4 Ozone (ppb)—Galveston
- VI.5.5 Particulate Matter (µg/m³)—Galveston

VI.5.1 Temperature Data (°F)—Galveston

100 533 84 685 683 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883 883		07-Aug	08-Aug 09-Aug	09-Aug	10-Aug	11-Aug 12-Aug 13-Aug 14-Aug 15-Aug 16-Aug 17-Aug 18-Aug 19-Aug 20-Aug 21-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug 23-Aug	23-Aug	24-Aug
63.3 64.4 63.6 63.6 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 63.7 <th< th=""><th>TIME</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>	TIME																		
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86.5 86.7 86.7 87.4 87.4 87.4 87.4 87.5 86.5 86.5 86.7 87.5 86.5 86.5 86.5 86.7 87.5 87.5 87.5 87.5 87.5 87.5 87.5 88.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 <th< th=""><th>1100</th><th>85.9</th><th>85.9</th><th>86.5</th><th>85.7</th><th>8.98</th><th>87</th><th>88.5</th><th></th><th></th><th>88.1</th><th>88</th><th>86.3</th><th>86.4</th><th>8.98</th><th>9.98</th><th>86.2</th><th>90.8</th><th>82</th></th<>	1100	85.9	85.9	86.5	85.7	8.98	87	88.5			88.1	88	86.3	86.4	8.98	9.98	86.2	90.8	82
67 86.9 86.5 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 8	1200		86.2	86.7	98	89.5	87.9	83.8	87.7		87	88.5	8.98	86.7	8.98	87.5	85.5		85.5
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86.7 86.4 87.1 86.7 86.5 87.2 87.2 87.3 87.1 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 <th< th=""><th>1400</th><th></th><th>1.98</th><th>8.8</th><th>86.4</th><th>87</th><th>89.5</th><th>88.8</th><th>87.9</th><th>87.8</th><th>87</th><th>88</th><th>87</th><th>86.9</th><th>87.2</th><th>298</th><th>9.98</th><th>84</th><th></th></th<>	1400		1.98	8.8	86.4	87	89.5	88.8	87.9	87.8	87	88	87	86.9	87.2	298	9.98	84	
86.5 86.7 86.6 86.7 86.7 86.7 86.8 87.4 86.6 87.4 86.6 87.4 86.6 87.4 86.6 87.4 86.6 87.4 86.6 87.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 86.7 <th< th=""><th>1500</th><th>86.7</th><th>86.4</th><th>87.1</th><th>86.7</th><th>87</th><th>98.6</th><th>89.4</th><th>87.7</th><th>87.3</th><th>87.1</th><th></th><th>87</th><th>86.9</th><th>87</th><th>86.7</th><th>98</th><th>84.8</th><th></th></th<>	1500	86.7	86.4	87.1	86.7	87	98.6	89.4	87.7	87.3	87.1		87	86.9	87	86.7	98	84.8	
85.2 85.1 86.2 87.1 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.4 87.2 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 <th< th=""><th>1600</th><th></th><th>85.7</th><th>9.98</th><th>86.9</th><th>86.8</th><th>87.7</th><th>88.7</th><th>87.2</th><th>86.7</th><th>8.98</th><th></th><th>9.98</th><th>9.98</th><th>86.7</th><th>86.5</th><th>85.9</th><th>85</th><th></th></th<>	1600		85.7	9.98	86.9	86.8	87.7	88.7	87.2	86.7	8.98		9.98	9.98	86.7	86.5	85.9	85	
84.6 83.3 85.3 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.7 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 86.5 <th< th=""><th>1700</th><th>85.9</th><th>85.1</th><th>88</th><th>86.1</th><th>87</th><th>87.1</th><th></th><th>86.5</th><th>85.7</th><th></th><th>87</th><th></th><th>85.7</th><th>86.1</th><th>98</th><th>85.7</th><th>84.4</th><th></th></th<>	1700	85.9	85.1	88	86.1	87	87.1		86.5	85.7		87		85.7	86.1	98	85.7	84.4	
84.6 83.2 84.5 84.5 84.2 83.4 84.7 84.6 84.8 84.2 84.8 84.7 84.8 84.8 84.2 84.9 85.4 83.9 83.9 84.5 84.5 84.5 85.4 83.9 83.9 84.5 85.3 84.5 84.2 84.9 84.1 84.1 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.2 84.3 84.5 84.3 84.5 84.3 84.5 84.2 84.3 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 <th< th=""><th>1800</th><th>85.2</th><th>84.1</th><th>85.3</th><th>85</th><th>85.8</th><th>86.5</th><th></th><th>85.7</th><th>83.8</th><th></th><th>98</th><th></th><th>84.7</th><th>85.3</th><th>85.4</th><th>92</th><th>83.5</th><th>81.8</th></th<>	1800	85.2	84.1	85.3	85	85.8	86.5		85.7	83.8		98		84.7	85.3	85.4	92	83.5	81.8
84.6 83.5 84.2 83.5 85.4 83.9 84.5 85.3 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 83.9 83.5 83.5 84.5 84.5 84.7 84.1 84.5 84.5 83.5 83.5 83.5 83.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 <th< th=""><th>1900</th><th>84.6</th><th>83.3</th><th>84.5</th><th>83.9</th><th>84.9</th><th>85.5</th><th></th><th>84.2</th><th>83.4</th><th>84.7</th><th></th><th></th><th>84.2</th><th></th><th>85</th><th></th><th>83.7</th><th>81.7</th></th<>	1900	84.6	83.3	84.5	83.9	84.9	85.5		84.2	83.4	84.7			84.2		85		83.7	81.7
84.4 83.5 84.1 84.9 84.1 84.1 84.1 84.2 84.2 84.1 84.1 84.2 84.2 84.2 84.2 84.2 84.5 84.5 84.3 84.3 84.3 84.5 84.3 84.5 84.3 84.5 84.3 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 84.5 <th< th=""><th>2000</th><th>84.6</th><th>83.5</th><th>84.2</th><th>83.5</th><th>85.3</th><th>88</th><th>85.4</th><th>83.9</th><th>83.9</th><th>84.5</th><th>85.3</th><th></th><th>84.2</th><th>84.8</th><th>84.9</th><th>84.5</th><th>83.8</th><th>81.9</th></th<>	2000	84.6	83.5	84.2	83.5	85.3	88	85.4	83.9	83.9	84.5	85.3		84.2	84.8	84.9	84.5	83.8	81.9
842 836 841 83 842 843 842 835 835 835 835 843 843 843 845 836 837 839 833 833 845 845 833 833 845 845 843	2400		83.6	84.2	83.1	85	84.4	84.9	84.1	84	84.1			83.8	84.5	84.7	84.7	84.1	81.9
84.2 83.5 83.9 82.7 84.1 83.6 84.2 84 83.2 82.7 83.9 83.9 83.3 83.9 84.6 84.2 83.9	2200		83.6	84.1	æ	84.2	84.2	84.3	84.2	83.5	83.6	84.5				84.5		84.1	82
	2300	84.2	83.5	83.9	82.7	84.1	83.6	84.2	84	83.2	82.7	83.9	83.9	83.3	83.9	84.6	84.2	83.9	83

VI.5.1 Temperature Data (°F)—Galveston

83.8 84.2 85.7 83.3 84.5 84.1 86.1 83.8 84.1 83.8 84.2 85.7 83.3 84.1 86.1 83.8 84.1 83.8 82.3 82.1 83.3 85.1 82.8 84.1 86. 83.8 84.1 83.8 82.3 82.3 82.3 84.1 86. 83.8 83.9 83.2 81.4 82.8 83.4 82.4 86.4 82.9 83.2 81.4 80.8 80.4 82.2 81.8 83.4 86.4 82.9 83.3 83.1 81.7 81.8 83.2 83.8 83.8 83.8 75.3 82.8 83.3 80.4 80.2 80.3 80.9 73.8 83.8 75.4 83.8 75.4 86.8 86.3 80.3 80.1 80.3 80.1 80.9 70.9 84.4 86.1 86.2 80.9 75.4 89.1 75.	25-	25-Aug 21	26-Aug	27-Aug	28-Aug 29-Aug 30-Aug 31-Aug	29-Aug	30-Aug		01-Sep	02-Sep	03-Sep	02-Sep 03-Sep 04-Sep 05-Sep 06-Sep 07-Sep	05-Sep	06-Sep		08-Sep	09-Sep 10-Sep		11-Sep
83.6 84.2 84.3 84.4 83.7 83.9 84.2 85.7 83.3 84.5 84.1 86.1 83.8 64.1 83.8 82.3 82.3 82.3 82.3 83.9 84.1 86.8 83.6 83.9 63.7 81.6 81.4 82.8 83.9 84.1 86.9 83.4 83.9 63.7 81.6 81.4 82.8 82.3 84.1 86.4 82.9 83.3 83.3 80.3 80.4 82.8 83.9 83.4 83.4 83.4 83.2 84.1 86.9 83.2 84.1 86.9 83.2 84.1 86.9 83.2 84.2 83.9 83.8 83.3 84.2 83.8 83.2 84.2 83.9 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8 83.8		_																	
838 841 838 821 833 851 821 833 851 822 84 828 83 841 86 835 833 837 816 814 82 84 828 827 841 834 832 841 834 832 841 834 832 841 834 832 841 834 832 841 834 832 841 834 832 841 834 832 834 834 832 834 834 832 834 834 832 834 834 834 832 834 834 832 834 834 803 834 834 803 834 834 832 834 834 832 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834		ш	82.9	83.8	84.3	84	83.7	83	84.2	85.7	83.3	83.3		88.1	81.7	77.4	79.9	83.5	83.8
822 834 837 816 814 82 84 828 821 841 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834 834		ш	82.5	83.8	84.1	83.8	82.3	82.1	83.3	85.1	82.8	83	84.1	98	82.6	75.5	81.8	83.5	83.5
812 834 834 808 604 825 834 802 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 803 798 798 803 803 798 793 798 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 793 <th></th> <th></th> <th>82.2</th> <th>83.6</th> <th>83.9</th> <th>83.7</th> <th></th> <th></th> <th>82</th> <th>84</th> <th>82.8</th> <th>82.7</th> <th>84.1</th> <th>83.4</th> <th>82.1</th> <th>75.2</th> <th>81.8</th> <th>83.2</th> <th>83.2</th>			82.2	83.6	83.9	83.7			82	84	82.8	82.7	84.1	83.4	82.1	75.2	81.8	83.2	83.2
81.6 82.9 83.3 83.1 81.7 81.7 81.4 83.4 78.7 80.8 82.8 83.3 82.8 79.8 82.4 83.3 83.1 81.4 83.8 83.4 83.8 83.8 83.8 83.8 75.3 81.1 83.1 83.2 83.3 84.2 81.8 81.8 83.8 75.4 82.3 84.7 85.2 82.3 84.4 80.5 80.3 81.8 81.8 83.9 84.8 75.4 83.8 85.6 86.4 85.5 84.6 86.6 87.3 86.9 88.3 89.4 75.1 86.2 86.3 86.4 85.5 84.6 86.6 87.3 86.9 86.9 87.3 89.5 89.4 87.3 89.5 89.4 87.4 89.5 89.4 89.5 89.4 89.7 89.2 89.2 89.2 89.2 89.2 89.2 89.2 89.2 89.2 89.2			82.2	83.4	83.8	83.4		80.4	82.5	83.4	82.2		83.5	79.6		14	81.4	82	83
90.8 92.8 93.3 92.6 79.9 79.9 79.9 92.4 83.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 79.9 <th< th=""><th>9.</th><td></td><td></td><td>82.9</td><td>83.3</td><td>83</td><td>80.3</td><td>80.1</td><td>83.3</td><td>83.1</td><td>81.7</td><td>81</td><td>83.4</td><td>78</td><td></td><td>73.9</td><td>78.2</td><td>83</td><td>83.2</td></th<>	9.			82.9	83.3	83	80.3	80.1	83.3	83.1	81.7	81	83.4	78		73.9	78.2	83	83.2
81.1 83.4 82.6 79.5 79.3 82. 83.2 83.6 79.3 84.7 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.3 89.6 75.4 79.1 85.4 75.4 89.2 86.2 86.3 89.2 86.3 89.2 86.3 89.2 86.3 89.2 86.3 89.2 86.3 89.2 89.4 89.2 89.3 90.1 92.4 92.4 79.1 86.2 86.3 86.3 86.3 89.5 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.4 89.2 89.2 89.2 89.2 89.2 89.	9.		80.8	82.8	83.3	82.8	79.9	79.8	82.4	83	6'08	79.8	83.8	76.3	80.1	14	78.6	82.3	83.2
82.3 84.7 85.3 84.4 80.5 80.3 81.8 84.2 81.4 81.9 85.4 85.3 84.4 80.5 80.3 84.5 86.6 87.3 84.5 86.5 87.3 89.5 83.9 89.6 76.7 77.1 87.3 89.5 89.5 89.5 89.5 89.6 77.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 <th< th=""><th>8.</th><td></td><td>81.1</td><td>83.1</td><td>83.9</td><td>82.6</td><td>79.5</td><td>79.3</td><td>82</td><td>83.2</td><td>80.8</td><td>79.9</td><td>84.6</td><td>75.1</td><td>78.1</td><td>74.2</td><td>73</td><td>81.9</td><td>83.6</td></th<>	8.		81.1	83.1	83.9	82.6	79.5	79.3	82	83.2	80.8	79.9	84.6	75.1	78.1	74.2	73	81.9	83.6
84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 84.2 85.2 85.3 89.3 89.4 79.1 79.1 95.4 95.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 81.2 <th< th=""><th>2</th><td></td><td>82.3</td><td>84.7</td><td>85.3</td><td>84.4</td><td>80.5</td><td>80.3</td><td></td><td>84.2</td><td></td><td>81</td><td>6.98</td><td>75.4</td><td>79.7</td><td>9:52</td><td>80.2</td><td>83.1</td><td>83.8</td></th<>	2		82.3	84.7	85.3	84.4	80.5	80.3		84.2		81	6.98	75.4	79.7	9:52	80.2	83.1	83.8
84.9 86. 86.4 85.5 84.6 86.6 87. 87.3 86.3 89.4 79.1 86.8 86.8 87.3 87.8 91. 89.5 89.3 90.1 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 92.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4 93.4<	531		83.8	92.6	84.2	85.2	82.3	83.2	84	85	83.6	83.9	9.68	76.8	79.3	75.6	81.1	84.6	83.8
85.8 86.4 86.8 87.3 87.8 91 89.5 89.9 90.1 92.4 92.9 81 86.2 86.3 87.3 87.3 90.5 94.8 90.1 91.1 93.1 95.6 94.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.3 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.2 83.4 83.2 83.4 83.2 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 83.4 </th <th>က</th> <td>-</td> <td>84.9</td> <td>98</td> <td>86.4</td> <td>85.5</td> <td></td> <td>9.98</td> <td>87</td> <td></td> <td>86.9</td> <td>88.3</td> <td>89.4</td> <td>79.1</td> <td>1:08</td> <td>16.4</td> <td>08</td> <td>85.6</td> <td>84.8</td>	က	-	84.9	98	86.4	85.5		9.98	87		86.9	88.3	89.4	79.1	1:08	16.4	08	85.6	84.8
86.2 86.9 87. 94.8 90.4 91.1 93.1 95.6 94.3 83.3 86.2 87.3 87.1 87.2 96.8 96.8 86.8 97.2 97.8 96.5 94.3 86.8 87.1 87.4 87.8 90.5 93.5 88.8 90.2 97.8 99.2 84.4 86.8 87.2 87.3 87.8 89.2 91.6 89.2 88.8 90.2 90.8 84.8 86.4 87.2 87.2 87.7 88.7 90.9 88.8 89.4 89.4 89.5 91.6 84.8 86.4 86.3 86.3 87.6 89.4 87.4 88.4 89.5 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8 84.8	12		82.8	86.4	86.8	87.3	87.8	91	89.5	6'68	90.1	92.4	92	81	6.08	78.1	27.5	85.8	86.3
86.2 87.3 87.4 87.5 92 96.8 88.6 89.4 92 97.8 96.5 84.1 86.8 87.1 87.4 87.8 90.5 93.5 88.8 88.6 97.2 97.8 99.2 84.4 86.8 87.2 87.3 87.8 89.2 91.6 88.2 88.9 97.5 87.9 84.9 86.4 87.2 87.2 87.5 88.8 97.7 88.5 89.4 89.4 89.5 91.5 84.8 86.4 86.2 87.7 88.2 88.4 87.4 88.4 88.5 91.5 84.8 86.4 86.3 86.3 86.3 86.3 86.3 87.5 87.5 84.6 87.5 84.6 87.5 84.6 87.5 84.6 87.5 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.5 85.2 85.2 85.2	.53		86.2	86.9	87	87.3	90.5	94.8	90.1	91.1	93.1	93.6	94.3	83.3		79.2	79.1	86.2	86.4
86.3 87.1 87.4 87.8 90.5 93.5 88.8 90.2 92.8 93.2 84.4 86.6 87.2 87.3 87.8 89.2 91.6 89.2 88.8 91.7 88.5 89.1 89.6 91.3 90.7 85.4 89.4 89.4 99.5 91.6 89.4 86.4 86.8 87.7 88.7 89.4 87.4 89.4 89.5 91.6 84.8 86.4 86.3 86.3 86.3 86.3 86.3 87.5 86.3 84.8 84.8 87.5 84.8 84.8 84.4 88.5 92.5 84.8 84.4 84.7 84.7 86.2 87.5 86.3 87.5 86.3 87.5 87.5 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4 84.4	4		86.2	87.3	87.1		92	8.96	88.6	89.4	92	97.8	9.96	84.1	81	78.9	82.2	86.2	1.98
86.6 87.2 87.3 87.8 89.2 91.6 89.2 88.8 99.6 91.6 100.6 84.9 86.6 87.2 87.2 88.8 91.7 88.5 89.1 89.6 91.3 90.7 85.9 86.4 86.8 86.8 87.7 88.7 89.9 88.8 88.4 89.5 91.6 84.8 86. 86.3 86.3 87.6 89.4 88.4 88.4 88.5 91.5 84.8 84.4 84.7 84.7 85.3 87.5 86.3 87.5 87.5 88.6 87.6 87.4 84.4 84.4 84.7 84.5 87.5 87.5 87.5 86.3 87.6 87.4 84.4 84.4 84.4 84.5 87.5 87.5 88.5 88.5 88.4 89.4 84.4 84.4 84.4 84.4 84.5 87.5 88.2 88.5 88.4 84.4 84.4 84.4 84.4	ω,		86.3	87.1	87.4		90.5	93.5	88.8	88.8	90.2	92.8	99.2	84.4	81	78.2	82.8	86.4	86.2
86.6 87.2 87.5 88.8 91.7 88.5 89.1 89.6 91.3 98.7 85. 86.4 86.8 86.8 87.7 88.7 88.6 88.4 88.4 89.4 89.5 91.5 84.8 86. 86.3 86.2 87. 89.4 88.4 87.4 88.5 92.5 84.6 84.4 84.7 84.7 86.3 87.5 86.3 87.5 87.5 88.6 87.5 84.4 84.4 84.5 84.5 87.5 86.2 85.6 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.4 84.4 84.4 84.4 84.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.4 87.4 84.4 84.4 84.4 84.4 84.4 84.4 84.5 87.5 87.5 87.5	121		86.8			87.8	89.2		89.2	88.8			100.6	84.9		77.6	83.2	86.8	85.7
86.4 86.8 86.8 87.7 88.7 89.9 88.8 88.4 89.4 89.5 91.6 94.8 86 86.3 86.3 87.6 87.5 86.3 87.2 92.7 92.1 84.4 84.4 84.7 84.5 85.6 87.5 87.5 86.3 87.5 87.5 84.4 84.2 84.4 84.5 84.5 87.5 87.5 85.3 84.5 87.4 84.4 84.4 84.5 87.5 86.2 85.3 84.3 86.1 87.2 84.4 84.1 84.2 84.5 87.5 86.2 85.3 84.8 86.1 87.2 84.4 84.1 84.2 84.2 85.2 85.3 84.3 85.1 87.2 84.4 84.1 84.1 84.2 84.2 85.3 85.4 85.3 85.1 85.1 84.4 84.1 84.2 84.2 84.2 85.3 85.4	231		9.98	87.2			88.8	91.7	88.5	89.1	89.6		98.7	85		8.77	82.3	86.3	85.8
86 86.3 86.2 87 87.6 89.4 88.4 87.4 88.4 88.5 92.5 84.6 84.4 84.7 84.2 86.3 86.3 87.5 86.3 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 </th <th>மு</th> <td></td> <td>86.4</td> <td>86.8</td> <td>86.8</td> <td>87.7</td> <td>88.7</td> <td>6.06</td> <td>88.8</td> <td>88.4</td> <td>89.4</td> <td></td> <td></td> <td>84.8</td> <td>81.3</td> <td>79.2</td> <td>83.3</td> <td>98</td> <td>85.1</td>	மு		86.4	86.8	86.8	87.7	88.7	6.06	88.8	88.4	89.4			84.8	81.3	79.2	83.3	98	85.1
85 85.3 85.3 85.3 86.3 88 87.5 86.3 87.2 92.1 84.4 84.4 84.7 84.5 85.6 87.6 87.9 86.9 87.5 87.9 88.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.1 87.9 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 87.1 </th <th>331</th> <td></td> <td>88</td> <td>86.3</td> <td>86.2</td> <td>87</td> <td></td> <td>89.4</td> <td>88.4</td> <td></td> <td>88.4</td> <td>88.5</td> <td>92.5</td> <td>84.6</td> <td></td> <td>79.1</td> <td>82.4</td> <td>85.5</td> <td>84.8</td>	331		88	86.3	86.2	87		89.4	88.4		88.4	88.5	92.5	84.6		79.1	82.4	85.5	84.8
84.4 84.7 85.2 85.6 87.6 87.9 86 87.6 87.2 89.5 84.4 84.4 84.5 84.5 84.5 87.5 87.5 87.9 85.6 85.6 86.9 87.4 84.4 84.2 84.4 84.5 87.5 85.2 85.3 84.8 86.1 87.2 84.4 84.1 84.2 84.2 85.9 85.4 85 84.3 85.5 88.4 84.1 83.9 84.2 84.7 84.7 85.5 84 83.9 85.1 89.7 82	231		88	85.3	85.3		86.3	88		86.3			92.1	84.4	80.1	78.8	82.3	84.7	63.9
84.4 84.4 84.5 84.9 85.2 87.5 87.9 85.8 85.6 85.9 87.4 84.4 84.5 84.5 85.2 85.2 85.3 84.8 86.1 87.2 84.4 84.1 84.2 84.2 85.9 85.4 85 84.3 85.5 88.4 84.1 83.9 84.2 FPW 84.1 84.1 84.7 85.5 84 83.9 85.1 89.7 82	201		84.4	84.7	84.7	85.2	85.6			98	87.6	87.2	89.5	84.4	79.3	79.5	82.5	84.3	93.6
84.2 84.4 84.4 84.5 85 87.5 86.2 85.3 84.8 86.1 87.2 84.4 84.1 84.2 84.2 85.9 85.4 85 84.3 85.5 88.4 84.1 83.9 84.2 FFW 84.1 84.1 84.7 85.5 84 83.9 85.1 89.7 82	201		84.4	84.4	84.5	84.9	85.2			85.8	85.6	86.9		84.4	78.9	80.5	82.7	84	83.7
839 842 FEW 841 841 847 855 84 839 851 897 82	23	_	84.2	84.4	84.4	84.5	85		86.2	85.3	84.8	86.1		84.4	78.7	81.7	83.3	84.1	83.7
83.9 84.2 FEW 84.1 84.1 84.7 85.5 84 83.9 85.1 89.7 82	23		84.1	84.2	84.3	84.4	84.2	85.9	85.4	98	84.3	85.5	88.4	84.1	78.2	81.6	83.6	84	83.3
	63		83.9	84.2	FEW	84.1	84.1	84.7	85.5	84	83.9	85.1	89.7	82	6.77	6'62	83.4	83.8	83.2

VI.5.1 Temperature Data (°F)—Galveston

79.6 80.6 79.5 80.7 77.9 80.6 77.5 77.5 77.5 77.5 77.5 77.5 77.5 77		12-Sep	12-Sep 13-Sep 14-Sep	14-Sep	15-Sep	16-Sep	17-Sep
83.2 78.4 82.1 79.6 80.6 83.1 80.5 82.4 79.3 80.6 82.9 81.2 82.5 79.5 78.8 82.6 82.6 81.9 77.9 77.5 82.7 81.6 77.9 77.5 75.9 82.7 81.1 76.8 77.5 74.5 82.9 78.5 76.7 77.5 77.5 82.9 78.5 76.7 77.5 77.5 86.5 83.7 80.6 77.5 77.5 86.5 83.7 80.6 77.5 77.6 86.5 84.6 81.3 86.8 87.3 86.5 84.6 81.3 86.8 83.9 86.5 84.6 81.3 86.8 83.9 86.5 84.6 81.3 86.9 84.4 86.7 77.9 83.9 86.8 83.9 86.8 77.5 83.9 86.8	TIME						
83.1 80.5 82.4 79.3 80 82.9 81.2 82.5 79.5 78.8 82.6 82.6 81.9 77.9 77.5 77.5 82.7 81.6 79.9 77.5 75.9 77.5 74.5 82.7 81.1 76.8 77.2 74.5 72.7 72.7 72.7 72.2 72.2 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 72.5 82.5 82.5 81.3 74.5 82.8 82.8 82.8 82.8 82.8 82.3 82.3 82.3 82.3 82.3 82.4 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5 82.5	0	83.2	78.4	82.1	79.6	9.08	78.7
82.9 81.2 82.5 79.5 78.8 82.6 82 81.9 77.9 77.5 82.7 81.6 79.9 77.5 75.9 82.7 81.1 76.8 77.5 74.5 82.3 78.5 76.7 77.5 77.5 82.3 78.5 76.1 80.6 77.5 77.5 84.3 80.5 75.6 77.5 77.5 77.5 77.5 86.5 82.6 78.2 81.3 77.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.7 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2 87.2	100	83.1	80.5	82.4	79.3	80	77.3
82.6 82. 81.9 77.9 77.5 82.7 81.6 79.9 77.5 75.9 82.9 78.5 76 77.5 74.5 82.9 78.5 76 77.5 74.5 82.9 78.5 76 77.5 74.5 84.3 80.5 75.6 77.5 77.5 86.1 82.6 78.2 81.3 74.5 86.5 83.7 80.8 82.3 76.8 86.5 84.6 81.3 86.2 81.3 87.1 74.5 83.8 86.8 83.9 86.5 85.3 75.5 81.3 84.4 82.5 86.5 75.5 83.8 88.8 84.4 84.4 86.3 75.5 83.8 88.9 84.4 86.3 75.5 83.8 83.9 84.4 86.4 77.9 84.3 84.5 84.5 84.6 77.9 87.5 <th>200</th> <th>82.9</th> <th>81.2</th> <th>82.5</th> <th>79.5</th> <th>8.87</th> <th>73.9</th>	200	82.9	81.2	82.5	79.5	8.87	73.9
82.7 81.6 79.9 77.5 75.9 82.7 81.1 76.8 77.5 74.5 82.9 78.5 76 77.5 72.5 84.3 80.5 75.6 79.4 71.5 85.1 FEW 76.1 80.6 72.6 86.5 83.7 80. 82.6 74.5 86.5 83.7 80. 82.3 76.8 87.1 77.4 83.9 86. 82.3 87.1 77.4 83.9 86. 82.3 85.3 75.5 83.8 84.6 83.9 85.3 75.5 83.8 86.8 84.4 85.3 75.5 83.8 83.9 84.4 85.4 77.9 83.4 88.9 83.9 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 <th>300</th> <th>82.6</th> <th>82</th> <th>81.9</th> <th>77.9</th> <th>5.77</th> <th>71.3</th>	300	82.6	82	81.9	77.9	5.77	71.3
82.7 81.1 76.8 77.2 74.5 82.9 78.5 76 77.5 72 84.3 80.5 75.6 77.5 77.5 85.1 FEW 76.1 80.6 72.6 86.5 83.7 80 82.3 76.8 86.5 84.6 81.3 83.8 76.8 87.1 77.4 83.9 86.8 81.3 87.1 77.5 83.8 86.8 84.4 85.3 75.5 83.8 88.8 84.4 85.3 75.5 83.8 88.8 84.4 85.3 75.5 83.8 88.8 84.4 85.3 75.5 83.8 88.8 84.4 85.4 77.9 83.4 86.9 84.4 84.6 77.9 87.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 79.9 81.5 80.3 81.5 <th>400</th> <th>82.7</th> <th>81.6</th> <th>6.67</th> <th></th> <th>6.27</th> <th>70.6</th>	400	82.7	81.6	6.67		6.27	70.6
82.9 78.5 76 77.5 72 84.3 80.5 75.6 79.4 71.5 85.1 FEW 76.1 80.6 72.6 86.5 82.6 78.2 81.3 74 86.5 83.7 80 82.3 76.8 86.5 83.7 80 82.3 76.8 86.5 84.6 81.3 83.8 76.8 87.1 77.4 83.9 86.8 87.1 85.3 75.5 83.8 83.8 84.4 85.3 75.5 83.8 83.9 84.4 85.3 77.9 83.4 88.9 84.4 84.6 77.9 83.4 88.9 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5	200	82.7	81.1	8.97		74.5	70.2
84.3 80.5 75.6 79.4 71.5 85.1 FEW 76.1 80.6 72.6 86.5 82.6 78.2 81.3 74 86.5 84.6 81.3 82.3 76.8 86.5 84.6 81.3 82.3 76.8 87.1 83.4 82.7 85.2 81.3 87.2 77.4 83.9 86.8 84.4 85.3 75.5 83.8 87.6 83.9 85.3 77.9 83.4 88.9 84.4 84.6 77.9 87.5 86.8 87.5 84.6 78.4 82.5 86.8 87.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 79.9 81.3 81.5 79.	009	82.9	78.5	92	77.5	7.2	69.4
85.1 FEW 76.1 80.6 72.6 86.5 82.6 78.2 81.3 74 86.5 83.7 80 82.3 76.8 86.5 84.6 81.3 83.8 76.8 86.5 84.6 81.3 85.2 81.3 87.1 77.4 83.9 86.8 82.3 85.3 75.5 83.8 88.8 84.4 85.3 75.5 83.8 88.9 84.4 85.3 77.9 83.4 86.9 84.4 84.6 78.3 87.3 80.5 81.5 84.6 78.3 87.8 84.5 80.7 84.6 79.9 81.8 84.4 80.7 84.5 81.5 81.3 81.5 80.3 79.8 82.1 81.3 81.5 80.3 79.8 82.1 81.5 79.5 79.8 82.2 80.9 79.1	700	84.3	80.5	75.6	79.4	71.5	70.9
86 82.6 78.2 81.3 74 86.5 83.7 80 82.3 76.8 86.5 84.6 81.3 83.8 79.2 87.1 83.4 82.7 85.2 81.3 87.1 77.4 83.9 86.8 82.3 85.3 75.5 83.8 84.8 83.9 85.3 77.9 83.4 86.8 84.4 84.6 78.3 81.8 81.5 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.6 78.4 82.5 86.8 81.5 84.5 84.5 84.5 80.7 80.3 79.8 82.1 81.3 82.7 80.3 79.8 82.1 81.5 79.5 79.8 82.2 80.9 79.5	800	85.1	FEW	76.1	80.6	72.6	73.1
86.5 83.7 80 82.3 76.8 86.5 84.6 81.3 83.8 79.2 87.1 83.4 82.7 85.2 81.3 79.2 87.1 77.4 83.9 86 82.3 87.3 87.3 84.3 85.3 75.5 83.8 87.5 84.4 87.3 84.4 85.3 77.9 83.4 88.8 84.4 87.5 83.9 84.6 77.9 87.3 87.3 87.5 80.3 87.5 84.6 79.9 81.8 84.4 80.7 80.3 81.5 84.5 79.5 81.3 81.5 80.3 81.5 80.3 79.8 82.1 81.3 81.5 79.5 80.3 79.8 82.1 81.3 81.5 79.5 79.8 82.2 80.9 79.5 79.5	006	98	82.6	78.2	81.3	74	75.4
86.5 84.6 81.3 83.8 79.2 87.1 77.4 83.9 86.2 81.3 87.1 77.4 83.9 86.8 82.3 85.9 75.5 83.8 84.4 83.9 85.3 75.5 83.8 88.3 84.4 85.4 77.9 83.4 88.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 84.5 79.3 81.8 84.4 80.7 84.2 79.3 81.3 82.7 80.3 79.8 82.1 81.3 82.7 80.3 79.8 82.1 81.3 81.5 79.5 79.8 82.2 80.9 79.5	1000	86.5	83.7	80	82.3	8.92	9.77
87.1 83.4 82.7 85.2 81.3 87.1 77.4 83.9 86.2 81.3 85.9 74.5 83.8 87.6 83.5 85.3 75.5 83.8 86.3 84.4 85.4 77.9 83.4 88.9 83.9 84.6 77.9 83.4 86.8 87.5 84.6 78.3 87.3 82.5 80.7 84.6 79.9 81.8 84.4 80.7 84.2 81.3 82.7 80.3 73.5 79.8 82.1 81.3 81.5 79.5 79.8 82.1 81.3 81.5 79.5 79.8 82.2 80.9 79.5 79.5	1100	86.5	84.6	81.3	83.8	79.2	79.1
87.1 77.4 83.9 86. 82.3 85.9 75.5 83.8 86.3 84.4 85.3 75.5 83.8 88.3 84.4 85.3 77.3 84.3 88.8 84.4 85.4 77.9 83.4 83.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.3 81.8 84.5 80.7 84.2 81.5 81.3 82.7 80.3 79.8 82.1 81.3 82.7 80.3 78.8 82.1 81.3 82.7 80.3 78.8 82.1 81.3 82.7 80.3	1200	1.78	83.4	82.7	85.2		6'62
87 74.5 83.8 87.6 83.5 85.3 75.5 83.8 88.8 84.4 85.3 78.3 84.3 88.9 84.4 84.6 77.9 83.4 88.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 84.2 79.9 81.8 84.4 80.7 84.2 81.5 81.3 82.7 80.3 79.8 82.1 81.3 82.7 80.3 78.8 82.2 80.9 80.2 79.5	1300	87.1	77.4	83.9	98	82.3	2.08
85.9 75.5 83.8 88.3 84.4 85.3 78.3 84.3 88.9 84.4 85.4 77.9 83.4 88.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 81.5 84.6 79.9 81.8 84.4 80.7 80.3 79.8 82.1 81.3 81.5 79.5 79.5 78.8 82.1 80.3 79.5 79.5 79.5	1400	87	74.5	83.8	87.6	83.5	80.4
85.3 78.3 84.3 88.9 84.4 85.4 77.9 83.4 88.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 84.2 79.9 81.8 84.4 80.7 79.8 82.1 81.3 82.7 80.3 78.8 82.1 81.3 82.7 80.3 78.8 82.2 80.9 80.2 79.5	1500	85.9	75.5	83.8	88.3	84	9.08
85.4 77.9 83.4 86.9 83.9 84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 81.5 84.6 79.9 81.8 84.4 80.7 80.3 79.8 82.1 81.3 82.7 80.3 79.5 78.8 82.2 80.9 80.2 79.5	1600	85.3	78.3	84.3	88.8	84.4	80.3
84.6 78.3 83.1 87.3 82.5 84.6 78.4 82.5 86.8 81.5 84.6 79.9 81.8 84.4 80.7 79.8 82.1 81.3 82.7 80.3 78.8 82.2 80.9 80.2 79.5	1700	85.4	77.9	83.4	88.9	83.9	79.8
84.6 78.4 82.5 86.8 81.5 84.5 79.9 81.8 84.4 80.7 84.2 81.5 81.3 82.7 80.3 79.8 82.1 81.3 81.5 79.5 78.8 82.2 80.9 80.2 79.1	1800	84.6	78.3	83.1	87.3	82.5	79.1
84.6 79.9 81.8 84.4 80.7 84.2 81.5 81.3 82.7 80.3 79.8 82.1 81.5 79.5 78.8 82.2 80.9 80.2 79.1	1900	84.6	78.4	82.5	86.8	81.5	78.8
84.2 81.5 81.3 82.7 80.3 79.8 82.1 81.3 81.5 79.5 78.8 82.2 80.9 80.2 79.1	2000	84.6	6'62	81.8	84.4	80.7	78.4
79.8 82.1 81.3 81.5 79.5 78.8 82.2 80.9 80.2 79.1	2100	84.2	81.5		82.7	80.3	82
78.8 82.2 80.9 80.2 79.1	2200	79.8	82.1			79.5	7.7
	2300	78.8	82.2	80.9	80.2	79.1	76.5

VI.5.2 Wind Speed Data (mph)—Galveston

	07-Aug	08-Aug	09-Aug	09-Aug 10-Aug	11-Aug	12-Aug	13-Aug 14-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	17-Aug 18-Aug 19-Aug 20-Aug 21-Aug 22-Aug 23-Aug 24-Aug	23-Aug	24-Aug
TIME																		
0	11.4	11.9	15	11.5	8	2.8	6.1	10.6	14.2	10.5	7.1	10.2	8.5	12.7	12.4	8.3	9.8	7.6
100	11.1	12.2	13.5	10.2	8.5	1.7	3	9.4	15.9	9.7	7.4	10.2	9.6	13.4	12.2	8.3	10.5	7.5
200	9	10.5	12.3	8.8	8.2	2.8	3.4	9.3	15.8	9.9	7.9	9	9.9	13.7	11.9	7.6	9.6	6.1
300	5.8	11.4	11.5	7	8.9	2.6	5.2	9.8	13.4	7.9	6.7	6.2	9.1	13.7	10.7	8.2	8.9	8.7
400	4.8	10.5	8.6	6.1	2.8	3.8	6.9	9.8	14.8	6.1	7.8	5.8	7	12.2	9.2	8.9	5.4	2.3
200	5.6	10.3	8.6	2.4	5.3	4.4	8.3	9.9	12.8	5.2	7.1	4.8	3.2	10.2	5.5	4	6.9	3.4
009	5.9	9.7	8.4	1.5	9.2	3.8	10.1	8.8	11.2	4.1	6.9	4.6	2.8	8.2	2.8	3.1	9.9	4.7
700	6.8	11.7	8.6	4.2	10.5	9	6.9	11	11.1	6.1	8.3	4	2.8	9.9	4.5	4.7	2.3	5.7
800	7.8	11.6	8.4	2	6.7	7.8	6.7	11.5	9.9	9.7	9.2	6.1	2.2	5.2	4.9	5.4	4.9	4.7
900	8.7	11	7.3	6.1	5.1	5	6.8	12	10.3	8.2	9.4	6.2	6.7	6.3	2.6	5	5.3	9
1000	8.9	14.2	8.3	7.2	7.3	5.5	9.8	13	10.1	6.5	5.9	8.4	7.7	8.3	4.5	8.5	5.7	5.4
1100	10.5	17	9.6	7.9	6.8	8.3	8.7	12.8	10.6	8.1	2.6	10.2	8.1	11.1	9.2	6	6.1	4.5
1200	9.6	14.2	9.3	8.2	7.4	5.9	9	13.5	11.1	13.5	9.8	9	9.3	11.4	11.3	10	2.8	5.7
1300	10.4	17.2	10	8.1	13.1	3.8	11.2	14.3	12.9	13.4	8.2	9.6	8	11	10.1	9.2	4.9	10.4
140	11.1	15.2	10.5	9.4	15.4	6.7	12.2	15.8	13.6	12.2	10.4	10	9.9	10.8	8.2	6	7.8	12.9
1500	12.2	15.2	10.9	9.3	16.6	8.3	12.4	14.9	12.7	15.5	11	10.3	9.9	11.2	9.1	9.5	9.6	11.4
1600	10.7	13.4	10.6	10.3	17.9	9.1	12.2	14.8	8.7	14.7	11.9	10	10.2	11.8	8.9	10.5	9.8	8.8
1700	10.9	11.2	9.9	11.2	16	10.2	10.8	14.4	=	14.5	12.5	9.3	11.1	13.1	8.7	9.2	9.1	8.3
1800	11.9	=	9	10.5	6.6	9.7	9.2	13.8	13.8	14.2	12.8	9.8	9.9	12.4	7.8	8.3	9.6	6.1
1900	11.8	œ	10.1	10.3	2	9.4	10.1	12.8	11.2	12.7	12.2	7.7	10.7	11.4	7.4	8.9	9.8	5
2000	12.6	10.5	9.6	10.4	2	10.7	10.8	5.2	9	12.3	11.5	8.2	11.6	11.5	8.8	6.6	9.2	4.1
2100	11.7	11.3	11.6	9.4	-	10.4	12.3	9	11	11.8	11.8	7.6	12.2	12.1	8.8	9.2	9.5	6.1
2200	#	13.5	11.3	11.3	-	9.4	11.7	11.2	11	9.8	12.6	7.1	12.4	12.3	8.4	2.8	8	7.3
2300	10.7	15.5	11.7	10.5	1.3	7.9	12.3	11.4	£	7.4	11.6	7.7	11.5	12.5	8.1	9.3	7.5	7.8

VI.5.2 Wind Speed Data (mph)—Galveston

7 27 0		7 [SNU-17]	20-AUS 2	C 600-67	6.		2	02-35p	25-50	24-50	04-5cm 03-5cm	20-00	200	20000	3	2	3
4	1 97	11.2	13.8	12.7	7.6	11	9.1	11.9	10.2	10.6	4.1	15.3	11.9	10.7	11.5	11.6	1
100 5.1 7	7.4 1	11.8	13.4	12.2	6.1	11.1	9.6	13.5	9.6	9.6	4.6	16.1	15.3	10.5	11.8	12.1	10.8
200 5.1 5	5.8 1	11.8	11.5	11.6	7.2	10.9	5.9	10.6	10.7	11.4	ဖ	12.7	13.6	10.6	11.3	13.4	6
300 4 4	4.5 1	10.2	11.3	10.4	9.6	9.9	5.1	9.7	11.6	11.8	6.1	11	12.3	12.7	ω	11.1	9.6
400 1.4 2	2.9	7.4	8	8.5	7.7	10.4	8.2	8.9	11.5	12.8	9	12.1	10.8	12	5.7	10.4	8.8
500 2.1 2	2.8	7.3	4.8	8.7	8.1	10.7	7.7	9.6	11.2	11	2	13.4	9.3	11.3	3.4	8.9	7.7
600 1.1 3	3.3	6.4	4.1	4.2	8.8	10.6	9.7	7	12.7	11.5	5	13.7	8	10.4	2.9	7.7	8.8
700 3 3	3.2	6.2	8.8	3.4	10.8	13.8	10.3	12.9	13.1	10.5	5.5	13.1	11	11.6	3.3	5.6	7.2
800 5.9 3	3.1	5.1	7.9	3.8	11.3	14.5	11.3	14	14.7	9.9	9.5	13	12.5	13	5.2	6.7	7.1
900 5.3 1	1.1	5.2	5	2	10.6	11.4	11.6	11.1	14.1	6	9.5	11.8	12.1	13.7	6.7	7.2	8.9
000 7.5 6	6.7	6.5	5.9	5.2	8.2	9.1	12.9	9.6	12.4	6.4	6.8	13.7	10	13	2.6	9.8	10.7
1100 9.9 8	8.2 1	10.1	7.5	9.8	4.8	7.1	14.1	9.3	10.5	3.8	9.6	13.1	13	12.8	8.1	12.5	12.4
1200 9.9 8	8.6	11.4	9.1	9.8	1.7	4.3	19.9	14.3	14.7	4.9	9.7	12.7	10.2	11.9	9.3	12	12.6
1300 10.2 9	9.7	11.2	9.2	10.3	8.7	11.6	20.9	17.1	17.4	8	9.8	11.9	13.1	13.3	11.5	13	11.6
1400 11.3 9	9.4	11.4	11	10.5	9.5	14.6	22.5	20	19.4	11	9.4	12.8	12.3	11.6	14.1	12.8	11.2
1500 10.7 9	9.8	12.2	11.2	11.4	9.7	14.9	23.4	19.6	19.6	9.5	5.9	11.4	16.3	11.2	15.6	12	11.9
1 600 9.9 10	10.3	13.1	12.1	12.3	11.5	16.2	21.6	20	20.7	10.8	9.2	8.3	15.6	12.6	13.2	12.8	10.8
1700 9 10	10.8	12.3	11.9	12.8	13.7	15.8	19.3	19.2	20.2	12.6	8.0	6.2	15.8	10.5	14.5	12.3	10.5
1800 7.9 10	10.9	11.6	11.1	12	12.8	16.6	14.8	18.9	16.4	10.2	1.1	9	17.5	9.6	11.5	11.9	9.5
1900 7.1 10	10.3	11.2	10.6	=	122	15.4	13.3	17.8	9	8.3	4.3	4.9	16	5.1	12.4	12	9.2
2000 7.8 10	10.3	10.9	10.6	10.1	11.7	13	7.6	17.6	10.7	9	2.5	5	13.3	10.6	11.6	11.5	8.6
2100 7.7 10	10.2	12.1	10.3	9.7	11.7	12.3	11.3	15	6.1	5.1	3.4	6.2	12.4	10	11.7	12.3	7.5
2200 6.8 1	1	12.2	10.7	9.3	9.6	10.2	8.1	13.8	8	4.8	4.7	5.3	12.2	10.9	13	11.1	7.2
2300 6.3 1	11 1	12.4	FEV	8.6	6	6.1	8.1	11.8	10.2	3.8	13	2.9	10.9	12.1	13.2	11.2	7.3

VI.5.2 Wind Speed Data (mph)—Galveston

	17-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep
	5.9	9.1	112	4.5	14.5	10.9
100	5.5	8.6	8.1	4.7	13.1	12.1
200	6.1	17.8	5.5	2	13.5	2.6
300	6.6	15.6	1.4	5.5	13	6.3
400	8.2	15.8	3.3	5.8	11.6	10.3
200	6.2	14.2	3.2	5.1	10.2	10.3
009	3.8	19.7	6.3	3.9	11.4	11.7
002	3.9	15.1	5.6	2	14.1	12.5
800	3	₩∃	3.5	11.8	13.1	13.5
900	5.1	6.8	4.1	12.2	13	13.9
1000	8.2	6.7	3.8	11.8	12.9	13.8
1100	11.6	6.2	4.2	11.5	13.1	12.9
1200	9.5	10.4	2.9	10.1	11.6	8.6
1300	10.9	7.5	3.8	9.2	11.8	8.7
1400	10.2	4.8	4.7	8.1	12.2	4.7
1500	11.9	12.6	6.5	6.4	13.1	5.6
1600	9.8	7	7.4	5.4	11.8	8.9
1700	11.1	9	9	4.3	12.5	4.4
1800	10.8	1.8	3.4	1:5	10.2	3.6
1900	10.8	7	4.5	4.8	9.8	3.3
2000	12.5	7.5	3.5	12.9	10.8	3.5
2100	12.5	9.6	4	13	11.8	2.7
2200	8	9.5	3.6	14.5	10.7	2.1
2300	9.8	8.3	4	12.9	10.3	2.8

VI.5.3 Wind Direction (0-359 degrees)—Galveston

	07-Aug	08-Aug	09-Aug	08-Aug 09-Aug 10-Aug 11-Aug	11-Aug	12-Aug	13-Aug	14-Aug 15-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	18-Aug 19-Aug 20-Aug 21-Aug 22-Aug	22-Aug	23-Aug 24-Aug	24-Aug
TIME																		
0	176	144	156	174	234	88	201	134	160	189	242	174	186	184	176	151	144	134
100	177	156	159	186	241	175	257	130	164	199	254	177	193	192	184	151	155	151
200	182	154	161	197	255	258	285	129	170	209	265	185	195	196	190	170	157	137
300	186	151	155	201	273	257	312	119	172	215	253	190	198	209	200	179	161	126
400	170	153	153	204	283	258	308	112	171	230	265	203	209	205	206	183	167	119
900	158	151	180	242	288	282	310	131	165	253	259	214	366	208	228	159	224	213
009	143	157	187	304	287	329	306	127	157	280	286	227	317	219	262	90	270	259
700	126	151	160	352	290	316	330	125	154	275	284	246	326	244	303	88	359	289
800	123	147	147	24	255	297	342	126	141	281	280	211	227	284	262	222	360	279
006	127	157	143	134	239	314	6	126	139	265	280	190	173	257	308	141	62	247
1000	119	151	132	151	260	-	24	130	138	276	274	177	157	190	86	66	43	349
1100	118	160	132	149	261	4	15	126	136	200	219	179	152	177	104	68	79	23
1200	123	161	125	161	262	351	22	118	142	183	174	173	156	169	102	80	348	117
1300	120	158	126	140	185	134	98	114	149	183	160	173	155	157	101	94	20	101
1400	126	160	129	142	189	133	98	119	154	176	157	166	152	162	120	88	70	98
1500	130	173	128	155	196	142	104	126	165	182	156	160	147	162	124	88	80	93
1600	131	167	128	160	205	159	104	126	140	182	154	162	149	170	131	88	83	98
1700	128	155	129	175	206	168	103	123	152	190	155	165	157	175	131	107	100	116
1800	125	160	131	186	194	178	102	134	182	198	160	169	161	178	138	116	106	135
1900	137	145	135	183	237	186	\$	147	180	199	164	169	171	178	138	115	107	141
2000	137	144	143	192	æ	190	107	133	164	206	172	173	174	180	144	110	115	135
2100	143	143	146	199	127	202	129	114	165	215	173	164	173	174	143	110	117	141
2200	141	149	148	204	273	208	144	142	177	227	174	157	178	175	145	132	120	148
2300	137	159	156	208	343	195	143	150	179	241	175	170	178	179	145	147	128	168

VI.5.3 Wind Direction (0-359 degrees)—Galveston

	25-Aug	26-Aug 27-Aug	27-Aug	28-Aug	28-Aug 29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	188	192	164	168	181	222	262	257	235	257	241	260	70	106	44	144	172	172
100	190	197	166	173	187	246	267	797	244	250	255	267	29	8	36	156	177	185
200	196	203	168	179	192	252	270	259	254	257	260	277	53	78	33	180	178	187
300	198	204	181	184	202	268	267	229	250	255	265	284	34	79	23	185	186	187
400	318	247	184	196	200	263	263	234	234	268	279	290	30	73	27	271	172	170
200	317	274	193	204	204	277	277	252	245	273	288	301	27	65	32	308	179	162
009	15	333	199	205	239	287	386	265	249	273	283	319	23	33	29	312	208	183
700	11	335	190	191	224	290	284	112	260	276	289	343	37	38	17	329	203	182
800	4	356	172	259	280	295	230	366	261	276	295	360	43	42	24	348	221	163
800	30	29	153	202	294	299	596	250	272	272	288	19	54	43	24	290	178	155
1000	93	133	141	171	188	292	287	246	279	267	288	19	61	28	22	12	159	152
4100	102	127	152	162	175	345	274	216	211	254	21	11	62	3	29	68	161	153
1200	104	128	160	153	175	58	238	138	196	209	15	15	77	82	29	103	173	151
1300	106	129	160	143	148	136	193	202	194	206	171	10	81	90	38	114	164	158
140	115	138	157	153	147	151	203	212	198	210	188	12	98	81	45	111	168	160
1500	136	145	153	151	156	163	208	211	203	210	189	52	112	82	25	123	165	153
1600	146	151	158	160	168	184	212	216	205	213	180	83	124	80	32	129	161	153
1700	148	154	159	163	168	195	215	219	208	215	195	28	129	75	27	130	167	158
1800	155	154	164	159	182	202	222	230	216	221	203	242	126	80	25	139	162	155
1900	158	159	162	158	192	208	227	243	219	237	214	270	118	71	48	144	160	152
2000	173	167	155	160	192	215	235	238	225	232	224	268	100	64	105	145	153	158
2100	166	163	152	162	197	226	247	233	238	234	240	311	90	61	126	138	158	165
2200	165	166	155	168	206	244	248	234	245	246	248	25	89	56	138	145	160	148
2300	170	171	164	FEW	211	255	239	236	254	246	262	71	108	54	126	159	159	150

VI.5.3 Wind Direction (0-359 degrees)—Galveston

	51	45	155	307	54	51
	52	69	161	317	52	49
200 15	152	90	166	335	54	41
300 16	160	101	7.3	295	49	39
400 15	158	127	21	316	46	20
500 18	165	161	351	313	41	47
600 16	166	190	19	316	34	48
14	147	188	354	346	30	55
800 12	124	FEVV	33	5	33	55
900 10	108	130	40	2	34	57
1000 10	104	148	34	360	37	89
1100 10	104	125	28	4	31	29
1200 101	5	83	17	7	25	25
1300 9	98	30	137	3	31	52
1400 11	112	331	114	358	18	359
1500 12	120	89	103	10	25	78
1600 10	105	110	88	22	41	66
1700 10	104	94	24	10	51	108
1800 g	97	41	23	88	25	112
1900	94	57	341	37	99	122
2000	93	77	33	38	56	102
2100 8	83	94	23	40	56	61
2200 8	88	116	10	41	54	ઝ
2300 4	43	137	329	46	54	32

VI.5.4 Ozone (ppb)—Galveston

07-A	9	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	07-Aug 08-Aug 09-Aug 10-Aug 11-Aug 12-Aug 13-Aug 14-Aug 15-Aug 16-Aug 17-Aug 18-Aug 19-Aug 20-Aug 21-Aug 22-Aug 23-Aug	23-Aug	24-Aug
	14	23	23	53	21	27	54	84	22	24	12	43	88	41	સ	84	Q	25
_	15	73	NGS NGS	82	20	27	NdS	33	25	SPN	11	45	99	SPN	33	51	SPN	45
	15	71	NGS NGS	28	19	23	SPN	36	32	SPN	9	41	92	SPN	34	53	SPN	45
	14	23	21	26	16	24	35	22	27	14	8	40	64	37	33	61	33	45
	12	23	20	26	14	23	48	22	19	11	6	42	64	38	34	65	8	£3
	15	24	21	20	13	19	41	24	18	10	8	37	27	36	32	ಟ	32	೫
	19	36	20	18	15	13	35	23	17	7	5	34	38	35	29	25	34	ઝ
	73	ಜ	73	18	14	22	37	22	16	12	12	37	33	34	20	92	31	34
	22	22	22	27	15	88	25	23	15	16	13	43	64	34	31	92	33	33
	24	38	23	8	22	39	69	24	15	70	20	44	69	40	36	70	36	37
	27	53	25	8	35	73	113	25	14	38	30	47	89	42	40	12	37	37
	34	27	22	30	45	93	136	25	16	39	38	44	89	38	52	72	41	41
	31	27	22	32	46	122	130	26	16	22	45	44	65	35	57	70	40	44
	33	27	23	38	49	132	135	36	15	25	50	41	63	36	9	67	46	43
	38	27	24	32	92	139	127	23	16	22	59	43	61	29	53	88	45	43
	33	38	17	36	54	141	101	22	14	19	63	43	90	28	49	68	52	45
	98	28	82	33	1,4	136	90	24	15	20	69	45	59	28	43	63	22	44
	46	28	28	76	32	128	88	25	18	20	64	50	27	28	43	89	54	9
	£	22	54	24	34	123	98	24	25	19	22	54	55	26	45	55	53	40
	34	92	23	24	34	115	28	23	36	18	43	54	99	26	45	53	55	89
	34	25	23	23	05	112	81	23	26	17	33	55	51	27	45	20	ಜ	41
	30	56	25	22	52	75	74	22	82	17	83	અ	47	78	45	45	છ	41
	26	23	28	25	40	72	62	22	25	15	88	88	49	33	84	44	54	44
	25	23	28	32	37	99	09	22	24	14	42	29	45	38	ន	44	53	42
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VI.5.4 Ozone (ppb)—Galveston

the state of the s	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug 31-Aug	31-Aug	01-Sep	02-Sep 03-Sep 04-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	39	36	46	33	27	27	24	36	35	12	2	17	99	47	20	24	36	16
100	68	36	NdS	32	27	SPIN	20	33	34	SPN	4	17	SPN	37	7	24	36	16
200	36	30	SPN	33	27	SPN	11	29	27	SPN	14	24	SPN	36	7	23	36	15
300	23	24	38	33	28	14	11	29	25	16	11	24	33	38	9	24	35	14
400	29	22	32	32	29	13	6	29	32	13	2	18	37	33	6	21	33	14
900	27	19	31	30	78	13	8	21	38	10	8	19	35	31	3	10	33	12
009	11	11	33	27	25	15	11	23	25	12	6	12	34	15	3	11	34	11
200	22	20	37	53	29	19	12	24	40	13	6	19	32	22	6	19	33	14
800	31	30	98	53	29	23	15	31	42	15	11	32	43	32	13	56	35	13
900	34	40	98	22	35	27	20	40	99	19	27	84	83	40	16	35	37	12
1000	45	40	98	24	32	34	47	54	65	17	47	101	70	54	22	37	38	15
1100	51	36	34	24	32	35	99	54	92	38	76	119	74	89	30	43	37	20
1200	99	ಜ	35	24	8	55	82	88	99	46	146	133	73	29	34	48	æ	18
1300	20	88	32	27	29	98	77	36	54	43	77	110	73	0.2	28	46	36	12
1400	43	40	30	27	23	82	74	88	49	37	65	100	78	29	88	90	35	17
1500	43	88	સ	56	23	93	76	38	51	36	73	111	77	61	23	44	35	19
1600	37	38	34	3,6	28	76	29	35	48	32	71	81	81	99	23	43	35	16
1700	33	88	23	30	78	64	28	37	44	29	64	75	85	55	22	40	33	16
1800	32	뚕	ಜ	28	27	55	55	ಜ	33	25	53	73	80	51	21	40	ಜ	16
1900	ಜ	34	36	28	27	41	52	30	32	22	54	58	75	44	18	33	ઝ	17
2000	34	37	26	26	27	34	45	28	30	13	48	63	73	37	27	38	29	15
2100	ઝ	44	27	3 8	38	ઝ	42	ಜ	24	12	44	28	72	33	25	33	28	13
2200	34	46	29	36	28	34	16	25	19	8	39	45	67	29	23	37	21	15
2300	32	45	32	FEW	28	27	19	30	14	5	27	53	65	22	24	37	16	15

VI.5.4 Ozone (ppb)—Galveston

TIME 15 21 19 1 55 59 200 15 21 19 1 55 59 200 15 17 20 0 51 SPN 200 18 22 18 0 51 SPN 300 17 25 13 0 48 23 500 21 25 13 0 48 23 600 21 23 12 0 48 23 600 23 24 28 18 27 45 32 800 36 24 14 22 45 32 32 1000 36 28 14 22 45 57 45 57 1300 36 26 13 70 45 67 47 47 1400 37 28 46 66 84 84 47<		12-Sep	13-Sep	13-Sep 14-Sep 15-Sep	15-Sep	16-Sep	17-Sep
15 21 19 1 55 15 17 20 0 53 18 22 18 0 51 21 25 13 0 48 21 25 13 0 48 21 23 24 28 0 32 30 24 22 4 34 38 24 14 22 45 39 26 13 60 58 40 31 60 58 45 39 26 13 60 58 40 31 20 65 88 39 28 40 63 88 31 28 40 68 84 32 28 40 68 84 31 26 27 49 67 40 22 49 67 62	TIME						
15 17 20 0 53 18 22 18 0 51 17 25 13 0 48 21 23 12 0 48 23 24 28 0 32 30 24 22 4 34 38 24 14 22 45 39 26 13 60 58 34 28 13 60 58 39 26 13 70 44 31 28 40 65 88 31 28 40 68 84 31 28 46 66 84 32 27 34 70 81 31 26 27 49 67 32 24 49 67 62 32 23 13 49 61 24 <th>0</th> <th></th> <th>21</th> <th>19</th> <th>1</th> <th>55</th> <th>59</th>	0		21	19	1	55	59
18 22 18 0 51 17 25 13 0 48 21 23 12 0 41 23 24 28 0 32 19 24 28 0 32 30 24 12 4 34 38 24 14 22 45 40 31 26 45 34 39 26 13 60 58 40 31 20 67 85 40 31 26 65 85 39 28 40 63 88 37 28 40 63 88 37 28 46 66 84 31 26 27 45 73 40 27 34 70 81 26 27 28 49 67 24 <th>100</th> <th>15</th> <th>17</th> <th>20</th> <th>0</th> <th>53</th> <th>NdS</th>	100	15	17	20	0	53	NdS
17 25 13 0 48 21 23 12 0 48 23 24 28 0 32 19 29 18 0 32 30 24 22 4 34 38 24 14 22 45 40 31 26 45 45 39 26 13 60 58 74 40 31 20 65 85 86 39 28 40 65 88 86 31 28 40 65 88 8 31 28 40 65 88 8 32 27 34 70 81 31 26 27 49 67 40 22 26 54 73 24 AQI 23 49 67 24 25 <th>200</th> <th>18</th> <th>22</th> <th>18</th> <th>0</th> <th>51</th> <th>SPN</th>	200	18	22	18	0	51	SPN
21 23 12 0 41 13 24 28 0 32 19 29 18 0 29 30 24 22 4 34 36 FEW 15 18 37 38 24 14 22 45 39 26 13 60 58 40 31 20 67 85 39 28 40 63 88 37 28 46 66 83 31 26 27 34 70 81 31 26 27 34 70 81 26 27 34 70 81 73 26 27 26 54 73 73 26 27 26 49 67 73 27 40 27 49 61 73 24	300	17	25	13	0	48	23
23 24 28 0 32 19 29 18 0 29 30 24 22 4 34 36 FEW 15 18 37 38 24 14 22 45 40 31 60 58 45 40 31 20 67 86 39 28 40 63 88 37 28 46 66 83 37 28 46 66 84 37 28 46 66 84 31 26 27 34 70 81 26 27 34 70 81 73 26 27 36 56 62 73 26 27 49 67 73 24 AQI 23 56 62 23 23 19	400	21	23	12	0	41	30
19 29 18 0 29 30 24 22 4 34 36 FEW 15 18 37 39 26 13 60 58 40 31 20 67 45 40 31 20 67 85 39 28 40 63 88 84 37 28 40 65 84 85 31 28 34 70 81 81 31 26 27 34 70 81 82 26 CAL 22 49 67 82 26 CAL 22 49 67 82 24 AQI 23 56 62 82 23 23 19 49 61 82 24 25 19 47 60 60	500	23	24	28	0	32	30
30 24 22 4 34 38 24 14 22 45 38 24 14 22 45 39 26 13 60 58 40 31 60 58 74 40 31 20 67 85 39 28 40 63 88 37 28 46 66 83 31 26 27 34 70 81 31 26 27 34 70 81 26 27 34 70 81 73 26 27 26 54 73 62 26 27 26 54 73 62 27 40 25 49 61 61 23 23 19 49 61 62 24 25 19 47 60 <td< th=""><th>009</th><th>19</th><th>29</th><th>18</th><th>0</th><th>29</th><th>21</th></td<>	009	19	29	18	0	29	21
36 FEW 15 18 37 38 24 14 22 45 39 26 13 60 58 40 31 20 67 85 40 31 20 67 85 39 28 40 63 88 37 28 46 66 84 36 27 34 70 81 31 26 27 34 70 81 26 CAL 22 49 67 2 26 CAL 22 49 67 2 24 AQI 23 56 62 2 23 23 19 49 61 24 25 19 47 60	700	30	24	22	4	34	32
38 24 14 22 45 39 26 13 60 58 40 31 20 67 85 39 28 40 63 88 37 28 40 63 88 37 28 66 83 37 28 46 66 81 31 26 34 70 81 26 27 34 70 81 26 CAL 22 49 67 24 AQI 23 56 62 24 AQI 23 56 62 24 25 19 47 62 24 25 19 47 60	800	36	FEW	15	18	37	39
39 26 13 60 58 40 31 20 67 85 40 31 28 40 63 88 39 28 40 63 88 8 37 28 46 66 84 8 36 27 34 70 81 8 36 27 34 70 81 7 26 22 26 54 73 67 26 CAL 22 49 67 7 27 AQI 23 56 62 7 24 AQI 23 56 67 7 23 23 19 49 61 7 24 25 19 47 62 7 24 25 19 46 60 60	900	38	24	14	22	45	20
34 28 19 70 74 40 31 20 67 85 39 28 40 63 88 37 28 40 65 83 37 28 46 66 84 31 28 34 70 81 31 26 32 72 82 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 24 25 19 47 62 27 24 10 46 60	1000	39	26	13	60	58	63
40 31 20 67 85 39 28 40 63 88 37 28 52 66 83 37 28 46 66 84 36 27 34 70 81 31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 61 23 23 19 49 61 24 25 19 47 62 24 25 19 46 60	1100	34	28	19	7.0	74	29
39 28 40 63 88 37 28 62 66 83 37 28 46 66 84 36 27 34 70 81 31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 24 25 19 46 60	1200	40	31	20	67	85	73
37 28 52 66 83 37 28 46 68 84 36 27 34 70 81 31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 46 60 22 24 10 46 60	1300	39	28	40	63	88	77
37 28 46 66 84 36 27 34 70 81 31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	1400	37	28	52	99	83	83
36 27 34 70 81 31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 46 60 22 24 10 46 60	1500	37	28	46	99	84	84
31 26 32 72 82 26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	1600	36	27	34	70	81	82
26 22 26 54 73 26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	1700	31	26	32	72	82	80
26 CAL 22 49 67 24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	1800	26	22	26	54	73	78
24 AQI 23 56 62 23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	1900	26	CAL	22	49	67	78
23 23 19 49 61 24 25 19 47 62 22 24 10 46 60	2000	24	AGI	23	56	62	76
24 25 19 47 62 22 24 10 46 60	2100	23	23	19	49	61	65
22 24 10 46 60	2200	24	25	19	47	62	48
	2300	22	24	10	46	09	30

VI.5.5 Particulate Matter (µg/m³)—Galveston

9.37 2.41 9.99 4.77 8.56 17.9 6.76 5.56 7.94 14.65 5.57 9.56 5.73 8.7 15.5 17.43 6.41 2.23 11.53 4.64 10.08 8.96 10.78 16.79 17.41 407 0.88 10.61 3.3 11.26 7.27 9.5 15.73 11.58 4.74 10.02 11.61 3.3 11.26 7.27 9.5 15.73 11.48 4.89 9.97 11.47 3.23 12.44 5.45 15.61 12.81 14.83 4.89 9.97 11.48 5.95 14.83 12.53 10.17 11.94 14.83 4.84 9.97 11.48 7.66 16.24 18.7 12.61 17.41 14.87 14.87 11.58 6.95 17.27 18.89 6.64 13.22 25.71 4.61 14.47 11.58 6.95 17.51	600	5	1	1		54-UMB	13-Aug 14-Aug 22-Aug 10-Aug 16-Aug 15-Aug 20-Aug 20-Aug 21-Aug 22-Aug 22-Aug 24-Aug	SNC-
241 939 477 856 17.9 6.76 5.56 557 956 573 87 15.5 17.43 6.41 464 10.08 836 10.78 16.73 17.41 4.07 3.3 11.26 7.27 9.5 15.73 11.58 4.74 3.23 11.26 7.27 9.5 15.73 11.58 4.74 182 14.93 12.53 10.17 11.94 14.83 4.48 182 15.08 17.72 18.23 8.11 12.48 7.21 182 15.63 17.72 18.23 8.11 12.48 7.21 186 16.24 18.7 12.61 7.05 21.75 7.44 186 16.24 13.25 14.54 12.63 17.61 24.64 5.02 186 16.24 13.25 14.64 12.83 14.84 4.81 186 17.61 13.25 14.64								
5.57 9.56 5.73 8.7 15.5 17.41 6.41 4.64 10.08 8.96 10.78 16.73 17.41 4.07 3.3 11.26 7.27 9.5 15.73 11.58 4.74 3.23 11.26 7.27 9.5 15.73 11.58 4.74 3.23 12.44 5.45 5.16 12.87 13.22 6.52 1.82 15.08 17.72 18.23 8.11 12.48 7.21 1.82 15.08 17.72 18.23 8.11 12.48 7.21 1.85 16.24 18.73 12.61 17.63 17.64 17.61 1.86 16.24 13.23 24.73 17.64 17.65 18.62 18.73 1.85 17.51 13.73 10.44 22.83 24.73 16.42 1.86 17.51 11.11 14.86 23.52 25.52 4.61 1.75 11.81 11.81	1.49	17.88 16.22	19.86	16.18	8.38	16.84	10.31	5.25
4.64 10.08 8.96 10.78 16.79 17.41 4.07 3.3 11.26 7.27 9.5 15.73 11.58 4.74 3.23 12.44 5.45 5.16 12.87 13.22 6.52 6.92 14.83 12.53 10.17 11.94 14.83 4.48 1.82 15.84 13.22 9.21 21.93 15.36 3.76 1.82 16.24 18.7 12.61 10.95 21.75 7.44 1.86 16.24 18.7 12.61 10.95 21.75 7.44 1.86 16.24 18.7 12.61 10.95 21.75 7.44 1.86 16.24 11.86 10.46 22.85 24.79 7.86 1.86 17.27 13.88 6.64 13.63 24.79 7.86 1.87 14.51 13.64 22.82 24.79 7.86 1.86 14.49 12.63 14.84 26.76 <th>7.62</th> <th>22.42 18.06</th> <th>24.32</th> <th>14.99</th> <th>10.78</th> <th>16.98</th> <th>7.56</th> <th>15.06</th>	7.62	22.42 18.06	24.32	14.99	10.78	16.98	7.56	15.06
3.3 11.26 7.27 9.5 15.73 11.58 4.74 3.23 12.44 5.45 5.16 12.87 13.22 6.52 6.82 14.83 12.53 10.17 11.94 14.83 4.48 1.82 15.08 17.72 18.23 8.11 12.48 7.21 1.84 13.25 9.21 21.93 15.36 3.76 1.85 16.24 18.73 12.63 17.75 4.48 1.85 17.27 13.88 6.64 13.32 25.57 4.61 1.85 17.27 13.88 6.64 13.32 25.57 4.61 1.86 17.51 14.54 12.63 12.63 13.78 13.64 1.85 17.51 13.73 10.44 22.89 24.79 7.86 4.49 17.51 13.71 14.86 23.52 22.52 9.15 4.49 17.51 14.71 14.86 23.52 22.52<	13.98	14.93 18.88	26.74	14.4	10.48	9.25	8.72	10.22
3.23 1.244 5.45 5.16 1.287 13.22 6.52 6.92 14.83 12.53 10.17 11.94 14.83 4.48 1.82 15.08 17.72 18.23 8.11 12.48 7.21 1.3.4 13.22 9.21 21.93 15.36 3.76 7.66 16.24 18.7 12.61 7.05 21.75 7.44 6.95 17.27 13.88 6.64 13.32 25.57 4.61 7.86 17.63 14.54 11.96 12.65 19.5 3.1 7.86 17.51 13.73 10.44 22.89 24.79 7.66 4.49 17.51 13.73 10.44 22.89 24.79 7.66 4.49 17.51 13.73 10.44 22.89 24.79 7.66 4.49 17.51 11.10 23.95 30.14 36.19 7.78 4.49 17.51 11.37 11.88 7.38<	12.28	17.08 17.6	22.18	15.48	8.77	11.67	15.5	5.71
6.92 14.93 12.53 10.17 11.94 14.83 4.48 1.82 15.08 17.72 18.23 8.11 12.48 7.21 13.54 13.22 9.21 21.93 15.36 3.76 7.44 7.66 16.24 18.7 12.61 7.05 21.75 7.44 7.85 17.51 13.88 6.64 13.32 25.57 4.61 7.85 17.53 14.54 11.96 12.65 19.5 3.1 4.49 17.51 13.73 10.44 22.89 24.79 7.66 4.02 14.17 11.06 29.95 30.14 36.19 7.86 3.05 13.71 11.16 27.57 27.52 24.5 27.5 4.02 11.37 11.16 27.55 23.85 23.15 16.42 5.61 13.71 11.6 27.5 23.8 23.15 16.42 6.26 11.07 6.2 8.55 <td>19.36</td> <td>18.05 15.91</td> <td>23.11</td> <td>14.21</td> <td>8.82</td> <td>17.45</td> <td>6.18</td> <td>12.72</td>	19.36	18.05 15.91	23.11	14.21	8.82	17.45	6.18	12.72
13.6 15.08 17.72 18.23 8.11 12.48 721 13.64 13.22 92.1 21.93 15.36 37.6 7.66 16.24 18.7 12.61 7.05 21.75 7.44 6.95 17.27 13.88 6.64 13.32 25.57 4.61 7.86 17.87 14.54 11.36 12.63 12.63 3.1 7.86 17.51 13.73 10.44 22.89 24.79 7.86 7.25 14.17 11.06 28.96 30.14 36.19 7.78 4.49 17.51 13.73 10.44 22.89 24.79 7.86 4.02 14.37 14.16 28.96 30.14 36.19 7.78 5.61 13.71 14.16 27.77 7.03 14.85 5.81 11.83 12.86 27.27 21.7 13.33 6.26 11.07 6.2 8.55 21.27 21.7 13.24 </th <td>16.16</td> <td>19.61 16.47</td> <td>27.66</td> <td>13.26</td> <td>10.7</td> <td>13.38</td> <td>8.93</td> <td>18.09</td>	16.16	19.61 16.47	27.66	13.26	10.7	13.38	8.93	18.09
13.54 13.22 9.21 9.21 13.63 15.65 16.24 18.7 12.61 7.05 17.75 7.44 6.95 17.27 13.88 6.64 13.32 25.57 4.61 7.85 17.63 14.54 11.96 12.65 19.5 3.1 3.95 13.18 12.63 10.17 7.61 24.64 5.02 4.49 17.51 13.73 10.44 22.89 24.79 7.66 4.02 14.17 14.06 23.95 30.14 36.19 7.78 4.02 14.17 14.10 23.95 30.14 36.19 7.78 3.06 1.37 11.11 14.86 23.52 25.25 9.15 5.61 13.71 11.6 5.75 23.8 23.15 16.42 5.61 13.71 11.6 5.75 23.8 23.15 16.42 6.26 11.07 6.2 8.55 21.27 21.7 7.33 <td>28.19</td> <td>22.27 22.71</td> <td>39.25</td> <td>17.02</td> <td>17.97</td> <td>22.41</td> <td>14.74</td> <td>7.22</td>	28.19	22.27 22.71	39.25	17.02	17.97	22.41	14.74	7.22
7.66 16.24 18.7 12.61 7.05 21.75 7.44 6.95 17.27 13.88 6.64 13.32 25.57 4.61 7.86 17.61 13.86 12.63 14.54 14.96 12.65 19.5 3.1 3.95 13.18 12.63 10.17 7.61 24.64 5.02 4.49 17.51 13.73 10.44 22.89 24.79 7.86 4.02 14.37 14.10 28.96 30.14 36.19 7.78 3.06 7.36 7.38 10.49 22.77 7.03 14.85 3.07 13.71 14.86 23.52 22.52 91.5 14.23 3.08 7.36 7.38 10.49 22.77 7.03 14.85 3.07 11.87 6.2 85.5 21.27 21.7 13.33 4.62 11.37 23.59 28.36 3.79 3.79 8.46 13.25 13.26	16.64	22.55 18.97	22.71	15.29	18.18	14.3	4.04	10.57
6.95 17.27 13.88 6.64 13.32 25.57 4.61 7.85 17.63 14.54 11.96 12.65 19.5 3.1 3.95 13.18 12.63 10.17 7.61 24.64 5.02 4.49 17.51 13.73 10.44 22.89 24.79 7.66 4.02 14.17 11.06 23.95 30.14 36.19 7.78 4.02 14.17 14.16 23.52 22.52 9.15 5.61 13.71 11.6 5.75 23.8 23.15 14.85 5.61 13.31 11.6 5.75 23.8 23.15 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.57 10.23 11.3 13.5 26.02 2.85 3.79 8.46 13.5 9.28 7.24 15.9	15.89	20.87 19.04	17.05	12.75	12	12.04	15.15	6.82
7.85 17.63 14.54 11.96 12.65 19.5 3.1 3.95 13.18 12.63 10.17 7.61 24.64 5.02 4.49 17.51 13.73 10.44 22.89 24.79 7.66 7.25 14.17 11.06 29.95 30.14 36.19 7.78 3.06 1.37 11.11 14.86 23.52 25.25 9.15 3.06 7.36 7.38 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.15 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 86.2 20.82	19.29	17.08 15.36	26.18	10.76	29.5	15.43	18.45	7.4
3.95 13.18 12.63 10.17 7.61 24.64 5.02 4.49 17.51 13.73 10.44 22.89 24.79 7.66 7.25 14.17 11.06 28.96 30.14 36.19 7.78 4.02 11.87 11.11 14.86 23.52 22.52 9.15 3.06 7.36 7.38 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.45 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.56 12.74 86.2 20.82 13.26 10.54 10.54	18.36	20.68 17.91	21.11	15.74	19.33	18.07	7.93	7.25
449 1751 13.73 10.44 22.89 24.79 7.66 7.25 14.17 11.06 28.96 30.14 36.19 7.78 4.02 11.97 11.11 14.86 23.52 22.52 9.15 3.06 7.36 7.38 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.15 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 18.5 20.82 13.26 10.54	30.75	28.27 17.47	23.26	11.71	14.04	24.02	13.85	11.55
7.25 14.17 11.06 28.96 30.14 36.19 7.78 4.02 11.97 11.11 14.86 23.52 22.52 9.15 3.06 7.36 7.98 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.15 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 86.2 20.82 13.26 10.54 10.54	19.09	29.22 18.62	20.39	12.51	14.24	14.32	5.21	6.92
402 11.97 11.11 14.86 23.52 22.52 9.15 3.06 7.36 7.38 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.15 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 86.2 20.82 13.26 13.26 10.54	19.18	23.43 13.27	23.52	9.22	14	17.56	9.3	11.03
306 7.36 7.38 10.49 22.77 7.03 14.85 5.61 13.71 11.6 5.75 23.8 23.15 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 6.29 11.88 7.93 3.19 22.89 27.05 5.65 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 862 20.82 13.26 10.54	15.11	22.26 17.53	19.85	5.85	21.56	17.62	14.15	0.68
561 1371 11.6 575 23.8 23.5 16.42 2.76 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 6.29 11.88 7.93 3.19 22.89 27.05 5.65 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 862 20.82 13.26 10.54	6 18.64	21.9 13.99	19.04	10.54	7.92	15.88	6.77	4.65
276 11.83 12.26 13.33 22.11 15.46 14.23 6.26 11.07 6.2 8.55 21.27 21.7 7.33 8.57 10.23 11.1 11.47 23.59 28.36 3.79 6.29 11.88 7.93 3.19 22.89 27.05 5.65 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 862 20.82 13.05 13.26 10.54	.42 16.3	13.28 16.81	24.07	9.83	16.39	6.54	20.98	6.43
6.26 11.07 6.2 8.55 21.27 21.7 7.3 1 8.57 10.23 11.1 11.47 23.59 28.36 3.79 1 6.29 11.88 7.93 3.19 22.89 27.05 5.65 4 8.46 13.5 9.28 7.24 15.9 26.02 4.84 4 12.66 12.74 8.62 20.82 13.05 10.54 9	14.75	11.59 14.82	23.52	10.03	26.46	11.48	15.12	3.21
8.57 10.23 11.1 11.47 23.59 28.36 3.79 1 6.29 11.88 7.93 3.19 22.89 27.05 5.65 4.84 4 8.46 13.5 9.28 7.24 15.9 26.02 4.84 4 12.66 12.74 8.62 20.82 13.05 13.26 10.54 9	36 15.94	18.63 16.91	17.56	2.61	5.37	9.33	11.37	5.72
6.29 11.88 7.93 3.19 22.89 27.05 5.65 8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 8.62 20.82 13.05 13.26 10.54	13.6	14.37 24.26	21.03	2.97	12.65	17.85	13.33	0.02
8.46 13.5 9.28 7.24 15.9 26.02 4.84 12.66 12.74 8.62 20.82 13.05 13.26 10.54	17.49	17.46 18.88	15.35	10.28	16.64	11.41	5.27	0.13
12.66 12.74 8.62 20.82 13.05 13.26 10.54 9	84 20.6	21.83 23.23	23.16	17.16	16.55	11.74	7.25	1.4
	82 13.42	19.18 18.33	7.26	9.1	15.92	16.81	9.6	6.55
7.78 12.16 9.95 8.82 6.75 14.04 11.72 7.18 8.02	19.38	20.78 21.93	12.31	10.22	15.75	12.32	12.59	1.6

VI.5.5 Particulate Matter (µg/m³)—Galveston

48 4.56 6.43 8.4 9.68 2 4.87 11.89 5.96 0.75 18.63 4.98 2.52 6.34 3.13 7.14 11.96 9.33 4.73 14.77 8.1 5.06 11.66 8.75 2.52 6.34 3.13 7.14 11.96 9.33 4.73 14.77 8.1 5.06 11.66 8.75 3.36 5.65 8.47 6.38 5.14 4.6 2.87 12.59 7.02 5.6 13.2 13.7 5.01 4.38 6.47 10.63 1.26 1.41 4.68 1.38 5.87 2.06 1.48 1.07 1.23 1.07 1.23 1.07 1.23 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08 1.07 1.08		25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep 04-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep 10-Sep	10-Sep	11-Sep
4.8 4.56 6.43 8.4 9.66 2 4.87 11.89 5.86 0.75 18.63 4.89 4.89 1.86 2.48 11.89 5.86 0.75 14.87 14.96 14.87 14.77 14.79 5.86 17.25 15.95 2.76 14.4 10.28 2.52 6.34 31.3 7.14 11.96 9.33 4.73 14.77 81 5.08 11.66 8.75 3.36 5.65 8.47 6.48 1.26 2.86 1.33 7.02 5.6 1.32 13.71 4.70 4.28 6.47 1.65 2.68 8.36 5.18 1.30 1.26 4.75 1.27 4.85 6.77 1.76 4.85 6.74 1.37 8.48 4.03 8.73 1.74 4.88 8.73 1.07 1.26 6.78 1.07 1.37 4.89 6.74 1.37 8.48 4.03 8.73 1.74 8.78 1.73 1	TIME																		
0 446 1035 884 1002 534 36 725 15.96 276 144 1028 252 6.34 313 7.44 11.96 933 473 1477 81 508 11.66 875 336 5.65 847 6.38 5.14 4.6 287 12.50 5.6 13.7 13.7 5.01 4.38 6.45 10.63 12.66 1.41 4.68 13.36 5.06 7.15 4.8 6.47 3.28 6.45 10.63 12.66 1.41 4.68 13.36 13.64 4.8 13.7 4.8 6.7 13.6 4.8 13.7 4.8 4.8 6.7 13.6 13.6 13.8 13.8 13.8 14.8 13.7 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8	0	4.8	4.56	6.43	8.4	99'6	2	4.87	11.89	5.96	0.75	18.63	4.99	26.76	5.79	35.76	5.86	7.36	5.13
2.52 6.34 3.13 7.14 11.96 9.33 4.73 14.77 8.1 5.08 11.56 8.75 12.59 7.02 5.6 11.56 13.2 13.71 4.8 13.26 7.02 5.6 11.56 14.1 4.68 13.38 5.87 2.06 7.15 4.8 5.01 4.38 6.45 10.63 12.66 14.1 4.68 13.38 5.87 2.06 7.15 4.8 6.47 3.28 5.19 14.52 10.23 2.98 15.81 10.26 4.16 4.26 6.8 6.7 4.8 4.03 6.8 6.7 13.8 5.17 4.8 4.03 6.8 6.7 10.7 13.6 13.9 10.8 13.7 14.8 13.8 10.7 14.8 14.7 14.8 14.7 14.8 14.7 14.8 14.8 14.8 14.9 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.8 14.	100	0	4.46	10.35	8.84	10.02	5.34	3.6	7.25	15.95	2.76	14.4	10.28	68.27	2.62	2.63	4.95	6.37	1.52
3.36 5.65 8.47 6.38 5.14 4.6 2.87 12.59 702 5.6 13.2 13.71 5.01 4.38 6.45 10.63 12.66 1.41 4.68 13.38 5.77 2.06 7.15 4.8 6.47 3.28 5.19 14.52 10.23 4.23 2.98 15.81 10.26 4.16 4.26 3.8 10.29 2.31 14.1 15.56 22.68 8.36 2.47 13.7 8.48 4.03 6.86 6.73 10.29 2.31 14.1 15.56 22.68 8.35 2.47 13.7 8.48 4.03 6.86 6.73 10.29 2.31 14.14 4.3 8.73 AQI 7.4 11.45 2.5 4.57 9.95 2.38 10.84 4.28 12.9 13.3 4.34 11.45 2.15 8.69 3.23 13.81 10.84 4.28 8.21 11.35 </th <th>200</th> <th>2.52</th> <th>6.34</th> <th>3.13</th> <th>7.14</th> <th></th> <th>9.33</th> <th>4.73</th> <th>14.77</th> <th>8.1</th> <th>5.08</th> <th>11.66</th> <th>8.75</th> <th>123.3</th> <th>1.36</th> <th>4.17</th> <th>1.63</th> <th>10.91</th> <th>3.87</th>	200	2.52	6.34	3.13	7.14		9.33	4.73	14.77	8.1	5.08	11.66	8.75	123.3	1.36	4.17	1.63	10.91	3.87
501 4.38 6.45 10.63 12.66 141 4.68 13.38 5.87 2.06 715 4.8 6.47 3.28 5.19 14.52 10.23 4.23 2.98 15.81 10.26 4.16 4.26 3.8 5.11 18.37 14.1 15.56 22.68 8.36 5.47 13.7 8.48 4.03 6.86 5.23 10.29 2.31 10.73 13.96 13.94 38.5 2.47 13.7 8.48 4.03 6.86 5.23 4.93 4.79 12.14 4.9 8.73 A.01 7.4 11.45 2.5 4.57 9.59 6.83 5.84 4.03 6.86 5.23 3.29 9.51 4.26 8.85 5.30 1.07 13.24 9.25 4.57 4.57 9.56 6.83 9.56 4.57 9.56 8.53 9.3 4.25 9.45 9.45 9.45 9.74 14.44 2.14 2.	300	3.36	5.65	8.47	6.38	5.14	4.6	2.87	12.59	7.02	5.6	13.2	13.71	42.25	2.64	1.02	22	16.29	4.03
647 328 519 1452 1023 423 298 1581 1026 416 426 38 511 1837 141 1556 2268 836 5.18 1305 1215 455 6.85 6.73 1029 231 1073 1306 1334 938 247 135 1214 403 6.86 5.23 120 4.83 4.78 12.14 4.9 8.73 401 7.4 1145 2.5 4.57 9.56 6.73 107 13.52 12.14 4.0 6.86 5.23 13.69 12.85 14.8 8.73 14.8 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.4 </th <th>400</th> <th>5.01</th> <th>4.38</th> <th>6.45</th> <th>10.63</th> <th>12.66</th> <th>1.41</th> <th>4.68</th> <th>13.38</th> <th>5.87</th> <th>2.06</th> <th>7.15</th> <th>4.8</th> <th>47.25</th> <th>86'0</th> <th>6.25</th> <th>21.15</th> <th>21.86</th> <th>1.92</th>	400	5.01	4.38	6.45	10.63	12.66	1.41	4.68	13.38	5.87	2.06	7.15	4.8	47.25	86'0	6.25	21.15	21.86	1.92
5.11 18.37 14.1 15.56 22.68 8.36 5.18 13.05 12.15 6.89 6.79 13.7 84.8 4.03 6.86 5.62 10.29 2.31 10.73 13.06 13.94 9.85 2.47 13.7 84.8 4.03 6.86 26.23 5.07 4.38 7.86 8.52 15.06 6.79 1.07 13.52 12.14 0.12 32.3 32.99 4.93 4.79 12.14 4.9 8.73 40.1 14.45 2.5 4.57 9.56 23.8 1.08 6.4 9.78 1.08 8.79 1.08 1.08 8.79 1.08 8.79 1.08 8.79 1.08 8.79 1.08 8.79 1.08 8.79 1.08 8.79 1.08 8.79 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08	200	6.47	3.28	5.19	14.52	10.23	4.23	2.98	15.81	10.26	4.16	4.26	3.8	53.7	1.53	9.94	2.17	17.02	92'9
10.29 2.31 10.73 13.06 13.94 9.85 2.47 13.7 8.48 4.03 6.69 2.69 2.67 10.7 13.52 12.14 0.12 3.32 32.99 4.93 4.78 12.14 4.8 8.73 4.01 13.52 12.14 0.12 3.32 32.99 4.03 4.93 4.79 12.14 4.8 8.73 4.01 3.93 4.6 6.4 9.78 3.29 4.03 4.28 4.28 4.34 8.25 9.02 16.05 1.56 48.69 30.46 6.4 9.78 14.16 2.15 9.64 9.7 14.16 6.41 1.28 7.13 7.64 8.28 2.51 40.4 11.44 22.15 68.79 17.8 17.86 8.73 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8	009	5.11	18.37	14.1	15.56	22.68	8.36	5.18	13.05	12.15	4.55	6.95	6.7	39.56	11.67	14.57	13.11	9.02	1.78
5.07 4.38 7.86 6.73 1.07 1.352 1.214 4.9 8.73 AQI 7.4 11.45 2.5 4.57 9.35 23.93 10.84 4.73 12.14 4.9 8.73 AQI 7.4 11.45 2.5 4.57 9.95 23.81 10.84 4.25 8.88 12.18 18.66 AQI 3.93 5.42 1.55 9.46 6.4 9.78 4.83 4.28 4.34 8.25 9.02 16.05 1.56 48.69 39.64 14.9 9.7 14.16 6.44 12.89 7.13 7.64 8.28 25.91 40.06 8.9 13.66 8.0 14.16 14.47 24.13 14.49 24.21 16.89 37.64 14.44 24.21 68.78 14.34 14.47 24.21 16.21 8.9 14.24 24.21 16.80 14.24 14.44 24.13 14.24 14.44 24.13 14.24 14.4	700	10.29	2.31	10.73	13.06	13.94	9.85	2.47	13.7	8.48	4.03	98.9	26.23	44.52	1.74	22.86	5.19	97	13.69
4.93 4.75 6.04 7.4 11.45 2.5 4.57 9.95 23.81 10.84 4.25 8.88 12.18 18.66 AQI 3.93 5.42 1.55 9.46 6.4 9.78 4.83 4.26 8.88 12.18 18.66 AQI 3.93 5.42 1.55 9.46 6.4 9.78 14.16 7.44 3.41 16.84 6.71 11.35 21.31 43.4 11.44 22.15 58.78 12.47 22.56 6.74 12.89 7.13 7.64 8.29 13.64 14.47 24.21 6.81 17.74 22.75 53.83 17.74 17.83 37.4 17.83 37.4 17.83 37.4 17.86 37.4 17.83 37.4 17.83 37.4 17.83 37.4 37.4 37.4 37.4 37.4 37.4 37.4 37.4 37.4 37.4 37.4 37.7 37.7 37.7 37.8 37.4 <th>800</th> <th>5.07</th> <th>4.38</th> <th>7.86</th> <th>8.52</th> <th>15.06</th> <th>6.79</th> <th>1.07</th> <th>13.52</th> <th>12.14</th> <th>0.12</th> <th>3.32</th> <th>32.99</th> <th>56.52</th> <th>1.99</th> <th>9.11</th> <th>16.01</th> <th>10.77</th> <th>19.36</th>	800	5.07	4.38	7.86	8.52	15.06	6.79	1.07	13.52	12.14	0.12	3.32	32.99	56.52	1.99	9.11	16.01	10.77	19.36
10.84 4.25 8.88 12.18 18.66 AQI 3.93 5.42 1.55 9.46 6.4 9.78 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.16 9.7 14.17 9.9 14.18 9.7 14.17 9.9 14.18 9.7 14.19 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.17 9.9 14.10 9.9 14.17 9.9 <t< th=""><th>800</th><th>4.93</th><th>4.79</th><th>12.14</th><th>4.9</th><th>8.73</th><th>AQI</th><th>7.4</th><th>11.45</th><th>2.5</th><th>4.57</th><th>3.95</th><th>23.81</th><th>65.32</th><th>0.82</th><th>14.46</th><th>2.27</th><th>5.24</th><th>14.12</th></t<>	800	4.93	4.79	12.14	4.9	8.73	AQI	7.4	11.45	2.5	4.57	3.95	23.81	65.32	0.82	14.46	2.27	5.24	14.12
4.83 4.24 4.34 6.25 9.02 16.05 1.56 48.69 39.64 14.9 9.7 14.16 7.44 3.41 16.84 6.71 11.35 21.31 43.4 11.44 22.15 58.78 12.47 22.56 6.74 3.41 16.86 8.25 25.91 34.06 8.9 13.65 28.65 37.4 17.38 6.74 9.51 9.07 16.36 8.33 13.84 21.99 10.81 20.5 27.5 25.48 37.4 6.74 9.51 16.36 8.33 13.84 21.99 10.81 20.5 27.5 27.5 27.5 27.5 27.5 14.21 9.94 18.99 34.69 6.89 11.71 9.13 11.3 4.81 9.71 14.04 14.08 14.75 18.99 34.69 7.33 7.78 13.4 12.09 14.72 22.75 15.31 14.08 14.75 18.99 <t< th=""><th>1000</th><th>10.84</th><th>4.25</th><th>8.88</th><th>12.18</th><th>18.66</th><th>AQI</th><th>3.93</th><th>5.42</th><th>1.55</th><th>9.46</th><th>6.4</th><th>9.78</th><th>63.22</th><th>99.8</th><th>20.61</th><th>18.83</th><th>15.53</th><th>4.42</th></t<>	1000	10.84	4.25	8.88	12.18	18.66	AQI	3.93	5.42	1.55	9.46	6.4	9.78	63.22	99.8	20.61	18.83	15.53	4.42
7.44 16.84 6.71 11.35 21.31 43.4 11.44 22.15 58.78 12.47 22.26 6.41 12.89 7.13 7.64 8.28 25.94 34.06 8.9 13.66 58.68 68.13 17.98 6.74 9.51 9.07 16.38 8.33 13.84 21.99 10.81 20.5 27.5 25.48 37.4 4.2 9.56 9.05 9.18 6.74 14.47 24.21 16.21 8.9 13.17 28.33 34.63 4.2 8.92 12.16 12.06 9.88 7.32 12.56 11.96 14.72 22.75 14.21 9.94 18.93 34.63 4.2 8.92 14.72 9.71 14.04 14.08 14.75 6.96 54.07 4.5 5.8 11.77 9.13 11.3 4.81 9.71 14.04 14.08 14.75 6.96 54.07 5.8 11.5 11.5<	1100	4.83	4.28	4.34	8.25	9.02	16.05	1.56	48.69	39.64	14.9	9.7	14.16	51.97	12.92	19.45	5.35	11.09	3.19
6.41 12.89 7.13 7.64 8.26 26.91 34.06 8.9 13.66 28.66 68.13 17.98 6.74 9.51 9.67 16.98 8.33 13.84 21.99 10.81 2.05 27.5 25.48 37.4 5.88 4.98 9.05 9.18 6.74 14.47 24.21 16.21 8.9 13.17 28.3 35.53 0.9 5.05 5.6 11.49 12.09 14.72 22.75 15.33 11.69 10.73 21.82 39.55 1.51 5.8 11.77 9.13 14.72 22.75 15.33 11.69 14.75 39.55 1.53 7.78 13.4 6.62 6.49 701 6.09 9.84 11.73 39.33 15.13 39.83 1.72 8.08 7.5 15.78 4.8 8.21 10.51 11.38 9.71 20.55 6.89 11.51 11.59 13.5 15.8 <th>1200</th> <th>7.44</th> <th>3.41</th> <th>16.84</th> <th>6.71</th> <th>11.35</th> <th></th> <th>43.4</th> <th>11.44</th> <th>22.15</th> <th>58.78</th> <th>12.47</th> <th>22.26</th> <th>33.27</th> <th>19.3</th> <th>21.72</th> <th>7.96</th> <th>12.61</th> <th>3.88</th>	1200	7.44	3.41	16.84	6.71	11.35		43.4	11.44	22.15	58.78	12.47	22.26	33.27	19.3	21.72	7.96	12.61	3.88
6.74 9.51 9.07 16.38 8.33 13.84 21.99 10.81 20.5 27.5 25.48 37.4 4.2 8.92 12.16 12.06 9.88 7.32 12.56 11.36 14.71 24.21 16.21 8.9 13.17 28.33 85.53 0.9 5.05 5.6 11.49 12.09 14.72 22.75 15.33 11.69 10.73 24.85 54.07 1.51 5.8 11.77 91.3 11.3 481 97.1 14.04 14.05 14.75 6.96 54.07 7.33 7.78 13.4 6.62 6.49 701 6.09 9.84 11.73 33.33 15.13 39.83 6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 20.55 1.72 8.08 7.5 7.56 15.08 10.02 14.57 31.49 2.48 7.66 17.56 </th <th>1300</th> <th>6.41</th> <th>12.89</th> <th>7.13</th> <th>7.64</th> <th>8.28</th> <th>25.91</th> <th>34.06</th> <th>8.9</th> <th>13.66</th> <th>28.68</th> <th>68.13</th> <th>17.98</th> <th>24.08</th> <th>12.03</th> <th>14.37</th> <th>13.84</th> <th>12.32</th> <th>2.43</th>	1300	6.41	12.89	7.13	7.64	8.28	25.91	34.06	8.9	13.66	28.68	68.13	17.98	24.08	12.03	14.37	13.84	12.32	2.43
5.88 4.98 9.05 9.18 6.74 14.47 24.21 16.21 8.9 13.17 28.33 86.53 4.2 8.92 12.16 12.06 9.88 7.92 12.56 11.36 14.21 9.94 18.99 34.69 0.9 5.05 5.6 11.49 12.09 14.72 22.75 15.33 11.69 10.73 21.82 39.55 1.51 5.8 11.77 9.13 11.3 4.81 9.71 14.04 14.06 14.75 6.96 54.07 6.89 11.51 13.15 15.78 4.8 8.21 10.51 11.33 9.71 20.55 1.72 8.08 7.5 15.08 15.08 10.51 11.73 33.33 15.13 39.83 1.72 8.08 7.5 15.08 8.21 10.51 11.38 9.71 20.55 2.48 7.56 16.69 16.75 17.56 14.57 10.75 1	1400	6.74	9.51	9.07	16.98	8.33	13.84	21.99	10.81	2.05	27.5	25.48	37.4	15.51	16.45	12.2	17.32	9.36	8.89
42 892 12.16 12.06 988 7.92 12.56 11.96 14.21 9.94 18.99 34.69 0.9 5.05 5.6 11.49 12.09 14.72 22.75 15.33 11.69 10.73 21.82 39.55 1.51 5.8 11.77 9.13 11.3 4.81 9.71 14.04 14.08 14.75 6.96 54.07 7.33 7.78 13.4 6.62 6.49 7.01 6.09 9.84 11.73 33.33 15.13 39.83 6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 20.55 1.72 8.08 7.5 7.09 8.27 5.67 15.08 10.02 14.6 14.57 31.49 5.48 5.44 17.66 17.97 3.72 1.96 14.71 10.78 14.71 10.78 14.71 10.78 14.71 10.78 14.71 1	1500	5.88	4.98	9.05	9.18	6.74	14.47	24.21	16.21	8.9	13.17	28.33	85.53	16.01	10.41	17.2	9.02	12.3	5.68
0.9 5.05 5.6 11.49 12.09 14.72 22.75 15.33 11.69 10.73 21.82 39.55 7.33 7.78 11.77 91.3 11.3 4.81 9.71 14.04 14.75 6.96 54.07 6.89 11.71 13.4 6.62 6.49 7.01 6.09 9.84 11.73 33.33 15.13 39.83 6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 20.55 1.72 8.08 7.5 7.09 8.27 567 15.08 10.42 10.31 20.58 2.48 17.56 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.52 10.31 20.68 5.48 5.64 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.52 10.31 20.78	1600	4.2	8.92	12.16	12.06	9.88	7.92	12.56	11.96	14.21	9.34	18.99	34.69	26.51	12.39	4.61	6.61	11.32	1.82
151 5.8 11.77 9.13 11.3 4.81 9.71 14.04 14.08 14.75 6.96 54.07 7.33 7.78 13.4 6.62 6.49 7.01 6.09 9.84 11.73 33.33 15.13 39.83 6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 9.71 20.55 1.72 8.08 7.5 7.09 8.27 5.67 15.08 10.02 14.57 31.49 2.48 17.56 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.22 10.31 20.68 5.48 5.64 10.09 10.07 14.6 27.1 17.96 17.27 37.2 17.66 14.51 10.75	1700	0.9	5.05	5.6	11.49	12.09	14.72	22.75	15.33	11.69	10.73	21.82	39.55	40.63	16.16	3.66	14.07	10.57	4.52
7.33 7.78 13.4 6.62 6.49 7.01 6.09 9.84 11.73 33.33 15.13 39.83 6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 9.11 20.55 1.72 8.08 7.5 7.09 8.27 5.67 15.08 10.02 14.57 31.49 2.48 17.66 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.22 10.31 20.68 5.48 5.64 10.09 6.90 14.6 27.1 12.86 17.27 37.2 12.66 14.71 10.76	1800	1.51	5.8	11.77	9.13	11.3	4.81	9.71	14.04	14.08	14.75	96.9	54.07	39.49	14.98	4.51	8.61	9.02	5.5
6.89 11.51 11.59 13.15 15.78 4.8 8.21 10.51 11.38 9.71 9.11 20.55 1.72 8.08 7.5 7.09 8.27 5.67 15.08 10.42 10.02 14.5 14.57 31.49 2.48 17.56 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.22 10.31 20.68 5.48 5.64 10.09 FPM 14.6 27.1 17.86 17.77 37.2 17.66 14.71 10.76	1900	7.33	7.78	13.4	6.62	6.49	7.01	6.09	9.84	11.73	33.33	15.13	39.83	18.21	13.91	2.68	8.93	8.94	1.39
1.72 8.08 7.5 7.09 8.27 5.67 15.08 10.42 10.02 14.6 14.57 31.49 2.48 17.66 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.22 10.31 20.68 5.48 5.64 10.09 FEM 14.6 27.1 17.86 17.77 37.2 17.66 14.71 14.76	2000	89	11.51	11.59	13.15	15.78	4.8	8.21	10.51	11.38	9.71	9.11	20.55	21.02	7.88	7.9	13.49	10.68	6.19
2.48 17.66 10.05 8.67 4.06 0.67 7.75 9.76 6.48 14.22 10.31 20.68 5.48 5.64 10.09 FBM 14.6 271 12.86 17.27 3.72 12.68 15.1 10.78	2100	1.72	8.08	7.5	7.09	8.27	5.67	15.08	10.42	10.02	14.6	14.57	31.49	18.1	13.76	1.68	4.63	13.44	2.15
548 564 1090 FBM 146 271 1286 1727 372 1266 151 1076	2200	2.48	17.66	10.05	8.67	4.06	29.0	7.75	9.76	6.48	14.22	10.31	20.68	23.38	24.41	4.54	12.12	13.13	11.34
3:40 3:04 10:33 1EV 14:0 2:11 12:00 11:21 3:12 12:00 13:1	2300	5.48	5.64	10.99	FEW	14.6	2.71	12.86	17.27	3.72	12.66	15.1	19.76	22.08	35.41	5.78	15.88	5.25	6.45

VI.5.5 Particulate Matter ($\mu g/m^3$)—Galveston

TIME 0 1.08 100 0.67 200 2.13 300 2.9 400 3.01 500 2.85	1.62				
	1.62				
	3.94	0.77	5.55	6.59	75.7
		1.31	7.47	7.04	8.08
	2.42	1.23	10.41	7.72	12.44
	1.28	1.01	9.2	9.84	11.85
	4	3.21	12.54	8.79	10.89
	4.05	0.75	13.21	8.89	10.78
600 10.02	1.37	3.35	16	8.89	9.95
700 3.3	2.58	3.35	18.2	11.96	13.69
800 6.64	FEW	3.92	12.16	13.3	13.38
900 7.12	5.89	5.31	5.35	12.91	11.88
1000 PMA	4.01	6.52	6.83	14.36	5.46
1100 PMA	4.78	86'5	5.82	14.74	4.59
1200 PMA	2.9	9.13	7.43	14.87	5.01
1300 2.99	1.49	9.53	8.13	14.37	8.55
1400 1.82	0.61	96'2	9.71	8.9	8.44
1500 1.75	0.5	6.71	9.13	9.8	9.47
1600 1.45	3.01	4.88	11.87	9.34	9.69
1700 1.44	0.38	3.58	11.34	12.37	9.13
1800 3.13	1.75	5.95	16.01	12.81	10.2
1900 1.94	3.68	7.25	18.36	13.6	13.6
2000 3.14	5.5	4.12	21.26	13.18	15.54
2100 2.86	2.25	5.81	24	14.06	15.63
2200 3.09	1.27	4.53	21.6	14.61	17.2
2300 2.25	1.96	3.8	16.57	11.26	19.89

VI.6 TNRCC DATA—HRM-3

VI.6.1 Temperature Data (°F)—HRM-3

VI.6.2 Wind Speed Data (mph)—HRM-3

VI.6.3 Wind Direction (0-359 degrees)—HRM-3

VI.6.4 Ozone (ppb)—HRM-3

VI.6.1 Temperature Data (°F)—HRM-3

- bin			-	2	7	_	1.0	-	0	o o	œ	9	150	œ	9	ر س	6	2	œ.	rC.	2	S		ις.	6
g 24-Aug		8	79.1	78.5	11.7	77.2	76.8	77.2	80.9	84.9	85.8	9.68	91.5	90.8	84.6	79.3	78.9	79.5	79.8	79.5	78.2	77.5	17	76.5	78.9
23-Au		82.8	81.5	80.7	79.1	77.7	76.5	76.3	78.3	84	78.5	17.7	81.7	84.2	85.1	85.7	87.1	87.9	87.5	85.7	83.9	83.8	83.2	82.1	81.1
22-Aug		83.8	82.9	82.4	82.3	80.8	79.2	79.2	82.1	85.6	87.2	98	84.7	84.8	86.3	88.1	89.7	90.6	89.4	86.9	84.9	84.4	84.1	83.5	83.5
21-Aug 22-Aug 23-Aug		81.3	81.2	7.08	80.5	80.5	79.6	79.2	82.6	84.8	87.5	90.9	94.1	95.3	36.2	6.78	<i>1</i> 6	1:96	91.9	6'88	87.2	828	84.9	84.7	84.3
20-Aug		79.8	79.7	79.2	79	78	76.8	77.7	80.8	84.2	88.5	80.8	93.6	95.1	96.7	98	97.2	95.5	92.8	90	87	84.8	83.6	82.6	82
19-Aug		81.1	81.1	80.9	79.8	77.7	77.3	77	81.6	85.3	88.2	90.5	93.3	95.2	26	8.96	95.9	94.5	92.7	83.8	86.1	84	82.5	81.2	80.5
18-Aug		81.1	80.3	80.4	79	77.9	77.3	8.77	81.3	84.2	87.3	90.3	93.2	95.4	6'96	97.7	97	95.7	94.5	91.8	88.2	85.3	83.9	82.4	81.9
17-Aug 18-Aug 19-Aug 20-Aug		81.4	80.3	79.3	78.9	78.5	78.7	79.5	81.7	85.2	9.88	91.7	94.5	97.5	98.8	99.1	99.1	97.9	95.1	92.5	88.7	85.9	83.8	82.4	81.6
16-Aug		81.2	80.4	79.7	78.9	78.3	78.3	73	82	85.8	88.4	91.1	93.3	96	97.7	99.1	99.5	6.98	94	91.6	88.5	2.98	86.1	84.7	83
15-Aug		83.8	83.4	82.8	82.4	81.8	80.8	81	84.4	8.98	89.1	90	90.7	93.5	93.6	93.8	946	94.3	92.5	88.2	86.7	84.4	83.1	82.4	81.8
14-Aug 15-Aug		83.3	81.8	26	81.9	80.7	79	79.7	84.1	97.6	88.7	91.8	92.8	93.2	93.9	93.3	92.2	91.8	90.2	87.9	96.6	85.6	84.7	83.8	84.1
13-Aug		90.6	79.5	78.1	76.7	78	76.2	76.9	83.1	86.4	89.5	92.8	95.2	96.7	97.1	97.3	97.1	94.6	92.5	89.2	86.4	85	83.7	82.9	83.3
11-Aug 12-Aug 13-Aug		77.6	77.6	77.3	76.6	75.9	75.3	76	79.2	83.3	86.2	90	92.2	94.5	96.6	97.6	97.8	97.5	96.2	93.9	84.1	84.8	84	84	82.3
11-Aug		80.8	80	79.2	79.4	79.2	78.6	79.2	81.3	84.1	87.5	90.8	93.1	95.8	97.5	98.8	99.8	99.5	98.7	87.5	81.6	78.9	78.5	78	77.9
10-Aug		81.2	80.9	80.1	79.5	77.8	77.3	77.2	80.7	83.4	98	89.9	92.8	94.8	96.7	97.2	96.5	96	94.7	92.3	88	85.7	83.9	82.7	81.5
09-Aug		82	81.4	84	80.9	80.4	80.4	80.8	84.3	86.4	88.9	91.5	92.8	92.6	93.8	93.3	93.1	92.8	90.4	87.9	85.7	84.3	8	81.9	81.3
08-Aug 09-Aug 10-Aug		83.5	82.9	82.5	82.4	82.1	82.3	83.4	84.8	87.1	89.3	90	90.5	88.6	91.7	92.3	91.6	90.5	9.88	98.6	85	83.7	83.2	82.7	82.5
07-Aug		80.8	88	79.9	80.1	79.6	6.77	79.3	83.3	86.2	87.7	87.6	83.8	91.1	92.6	92.5	92.4	91.7	90.2	87.4	86.1	85.5	84.6	84	83.5
		0	100	200	300	400	200	909	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
	TIME																								

VI.6.1 Temperature Data (°F)—HRM-3

Me 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Parameter and the second	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep 07-Sep		08-Sep	09-Sep	10-Sep	11-Sep
788 811 809 812 805 845 845 845 845 845 845 859 817 859 157 867 867 845 859 847 157 808 747 758 747 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 868 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 867 <th>TIME</th> <th></th>	TIME																		
774 80.0 80.1 80.1 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2 80.2	0	78.8	81.1	80.9				83.6		84.5	83.9		85.8	LST		75	76.5	83	82.5
755 781 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 <th>100</th> <th>77.4</th> <th>80.8</th> <th>80.2</th> <th>81.1</th> <th>80.7</th> <th>80.3</th> <th>82.5</th> <th>86.2</th> <th>83.5</th> <th>83.3</th> <th>85.9</th> <th>84.7</th> <th>LST</th> <th>80.8</th> <th>74.1</th> <th>76.6</th> <th>82.7</th> <th>81.7</th>	100	77.4	80.8	80.2	81.1	80.7	80.3	82.5	86.2	83.5	83.3	85.9	84.7	LST	80.8	74.1	76.6	82.7	81.7
754 774 803 807 804 805 805 810 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 805 <th>200</th> <th>76.5</th> <th>79.1</th> <th>80.5</th> <th></th> <th>80.2</th> <th>79.8</th> <th></th> <th>83.2</th> <th>82.3</th> <th>82.9</th> <th>84.6</th> <th>82</th> <th>LST</th> <th>79</th> <th>73.7</th> <th></th> <th>82</th> <th>80.5</th>	200	76.5	79.1	80.5		80.2	79.8		83.2	82.3	82.9	84.6	82	LST	79	73.7		82	80.5
75 76 78 78 78 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80<	300	75.4	77.4	80.3	80.7	80	79.1	80.8	82.7				81	LST	77.9	73	76.7	81.1	80.4
748 753 781 782 813 823 813 824 813 813 813 824 813 813 813 813 813 813 813 813 813 813 813 813 813 813 813 813 813 813 814 844 845 845 865 867 157 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 773 745 745 773 745 773 745 773 843 843 843 843 843 843 843 843 843 843 843 843 <th>400</th> <th>22</th> <th>76</th> <th>78.8</th> <th>79.5</th> <th>78.6</th> <th>78.3</th> <th>80.2</th> <th>83</th> <th>82.4</th> <th>82.6</th> <th></th> <th>80.1</th> <th>LST</th> <th>7.97</th> <th>72.6</th> <th>76.6</th> <th>79.8</th> <th>80.5</th>	400	22	76	78.8	79.5	78.6	78.3	80.2	83	82.4	82.6		80.1	LST	7.97	72.6	76.6	79.8	80.5
756 767 781 783 78.5 81.8 81.7 81.7 82.2 80.4 LST 75.6 75.6 75.6 75.6 75.7 75.7 75.6 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.7 75.2	200	74.8	75.3	78.1	77.9	78.1	78.5	79.7	82.4	81.5	82		79.8	LST	76.2	72.3	76.3	79.9	80.5
736 614 618 63.1 62.2 61.4 64.4 64.5 64.5 68.5 68.7 17.7 77.7 74.5 77.2 83.7 64.6 68.1 68.2 68.2 68.2 68.4 67.3 87.5 96.5 97.6 17.7 74.5 77.8 80.5 86.7 68.1 68.2 68.2 68.2 68.2 98.3 90.9 98.8 91.5 96.7 17.8 17.8 17.8 80.5 80.6 97.1 90.2 94.4 94.7 90.5 94.7 90.9 17.8 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 <th>009</th> <th>75.6</th> <th>7.92</th> <th>79.1</th> <th>78.3</th> <th>77.1</th> <th>78.9</th> <th>80.5</th> <th></th> <th>81.7</th> <th>81.7</th> <th>82.2</th> <th>80.4</th> <th>LST</th> <th>75.6</th> <th>72.6</th> <th>76.2</th> <th>79.9</th> <th>81.7</th>	009	75.6	7.92	79.1	78.3	77.1	78.9	80.5		81.7	81.7	82.2	80.4	LST	75.6	72.6	76.2	79.9	81.7
837 846 851 862 854 873 877 906 LST 802 778 805 867 867 861 862 862 863 862 863 862 863 864 873 871 966 LST 867 872 873 871 862 872 874 871 873 872 874 873 1007 893 LIM 863 872 873 872 873 872 874 873 1007 893 LIM 863 874 874 874 874 874 874 873 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007 1007	200	79.6			83.1	82		84.4	84.5	84.3	84.5	92.6	85.7	LST	77.7	74.5	77.2		82.1
86.7 88.8 88.9 89.2 89.3 99.2 99.3 99.3 99.5 99.4 15.5 94.4 LST 86.7 87.9 87.9 98.9 91.5 94.4 94.3 96.3 10.7 98.7 1M 85.9 82.6 84.7 89.7 93.8 93.1 94.2 94.4 94.1 10.6 10.7 10.6 10.7 10.7 10.7 1M 85.9 84.8 85.7 84.7 86.8 96.7 10.6 10.7 10.6 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.8 87.9 87.9 87.8 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 87.9 <th>800</th> <th>83.7</th> <th>84.6</th> <th>85.1</th> <th>86.2</th> <th>85.2</th> <th>85.1</th> <th>88.5</th> <th>88.4</th> <th></th> <th>87.7</th> <th></th> <th>90.6</th> <th>LST</th> <th>80.2</th> <th>77.8</th> <th></th> <th>85.3</th> <th>85.5</th>	800	83.7	84.6	85.1	86.2	85.2	85.1	88.5	88.4		87.7		90.6	LST	80.2	77.8		85.3	85.5
892 908 911 905 921 931 982 941 943 940 941 943 960 1015 962 941 941 941 960 1015 962 1044 1037 LIM 853 926 842 963 1015 963 977 966 1044 1015 1016 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017 1017	900	86.7	88.1	88.8	89.2	89.3	89.2	93.3	90.9	89.8		95.3	94.4	LST	83	84	83.3	88.2	85.5
83.7 94.6 96.2 101.5 98.3 97.7 98.6 104.4 101.5 104.4 103.7 LIM 89 94.8 85.7 92.4 94.4 96.6 96.2 96.8 99.1 104.5 101.2 104.5 101.5 107.3 105.3 90.6 90.7 85.8 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6	1000	89.2	90.8	91.1	90.5	92.1	93.1	98.2	94.4	94.1	94.9	100.7	99.7	LIM	85.9	82.6	84	90.1	82.6
92.4 94.6 96.6 96.7 96.8 99.1 104 101.9 100.4 101.6 101.6 101.6 101.6 101.6 101.6 101.6 101.6 102.3 103.7 106.7 90.2 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7	1100	89.7	33	93.7	94.3	94.6	96.3		98.3	97.7	98.6	104.4	103.7	LIM	88		85.7	91.4	80.3
94.9 94.9 97.1 98.2 101.2 102.3 103.7 108.6 106.7 106.9 103.7 105.9 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.7 90.8 90.8 90.8 90.8 103.7 105.0 107.7 105.9 93.8 91.8 86.2 88.3 88.3 90.8 103.8 103.7 105.0 107.7 105.9 91.7 105.9 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.8 91.	1200	92.4	94.4	92.6	96.2	8.96	99.1	104		100.4	101.6	107.3	105.3	90.6	2.06	82.8		80.8	83.1
94.4 94.2 95.4 96.4 96.7 105.5 105.1 105.2 107.7 105.9 93.8 91.8 96.7 86.2 86.7 105.2 105.2 107.7 105.9 93.9 91.4 96.7 96.7 105.3 105.2 107.3 105.3 97.4 97.4 86.7 86.2 98.7 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 105.3 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5	1300	93.3	94.9	94.9	97.1	98.2	101.2	105.4	104.5	102.3	103.7	108	106.7	92.5	92.1	85.4	88.5	90.1	86.9
94.5 94.8 94.4 96.2 96.9 105.8 105.8 105.8 105.7 105.3 105.9 94.7 94.4 96.4 96.4 96.4 96.4 96.4 96.4 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.8 96.8 96.8 96.8 96.8 96.8 96.8 96.8 96.8 96.8 96.8 96.8	1400	95.4	94.9	8	96.4	99.7	102.5	106.4	105.8	103.1	105.2	107.7	105.9	93.8		86.2		91.1	88.8
93.3 94.2 93.5 94.2 94.5 105.3 105.3 105.3 105.3 105.3 105.3 90.5 90.5 90.5 90.5 90.5 90.5 105.3 105.3 105.3 105.3 104.5 104.5 104.5 104.5 104.5 104.5 104.5 104.5 104.5 105.4 102.5 95.4 102.5 95.4 107.3 86.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 87.5 <t< th=""><th>1500</th><th>94.5</th><th>94.8</th><th>94.4</th><th>96.2</th><th>98.9</th><th>103.7</th><th>106.9</th><th>105.8</th><th>103.5</th><th>105.2</th><th>107.3</th><th>92</th><th>94</th><th></th><th>86.1</th><th>88.2</th><th></th><th>90</th></t<>	1500	94.5	94.8	94.4	96.2	98.9	103.7	106.9	105.8	103.5	105.2	107.3	92	94		86.1	88.2		90
91.1 92.1 91.7 92.6 94.2 104.5 84.9 99.6 103.8 102.5 95.4 91.3 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9 96.9	1600	93.3	94.3	93.5	94.6	8.96	103.3	105.8	104.8	103.2	105.3	105.6		92.6	90.2	85		83.9	8
88.3 89.4 88.8 89.5 96.1 102.1 81.2 96. 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.8 101.8 98.9 98.8 98.8 98.1 99.1 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8 99.8	1700	91.1	92.1		92.6	94.2	101.5	104.5	84.9	93.6	103.8	102.5	95.4		86.9	83.2	85.5	88.2	88.8
86.3 86.6 86.4 86.6 86.4 86.6 87.1 91.1 93.1 83.1 93.9 95.8 PMA 86.5 87.3 77.2 82.3 84.4 84.2 84.6 84.2 85.2 88.9 95.1 83.1 93.4 97.4 PMA 85.5 79.2 77.2 82.3 83.1 87.3 87.3 91.2 90.8 17.2 90.8 77.2 76.6 82.3 82.1 81.9 82.3 82.3 86.4 85.1 85.3 90.6 89.8 LST 82.8 75.7 76.6 83.1	1800	88.3	89.4		89.3		96.1	102.1		88			W.	88.2	83.8		82.8	86.8	86.3
84.4 84.2 84.6 84.2 86.3 95.1 83 91.4 93 92.4 PMA 85.5 79.2 77.2 82 83 82.8 83.3 84.2 87.6 92.5 82.9 89.1 91.2 90.8 PMA 84.1 77.2 76.6 82 82.1 81.9 82.8 82.3 86.5 90 81.5 87.3 90.6 89.8 15.1 76.7 76.5 83 81.4 81.2 82.1 85.3 86.4 85.1 85.3 89.1 87.5 151 76.7 76.6 83.1	1900		999	86.4	9.98	87.1	91.1	99.1	83.1	ಜ	න	95.8	PMA	9.98			82.3		84.5
83 828 833 842 876 925 821 912 908 PMA 841 772 766 82 82.1 81.9 82.8 82.3 86.5 90 81.5 87.3 90.6 89.8 LST 82.8 76.1 76.3 83 81.4 81.2 82.1 82.2 85.4 85.4 85.3 89.1 87.5 LST 81.8 75.7 76.6 83.1	2000	84.4	84.2	84.6		85.2		95.1	æ	91.4	အ	92.4	PMA		79.2	77.2	82	83.6	83.8
82.1 81.9 82.8 82.8 82.2 85 88.4 85.1 85.3 89.6 87.5 87.8 87.8 87.8 87.8 87.8 87.8 87.8	2400	ន	82.8	83.8	83.3	84.2		92.5	82.9	89.1			PMA	84.1	77.2	9.92	82	83.4	83
81.4 81.2 82.1 81.5 82.2 85 88.4 85.1 85.3 89.1 87.5 LST 81.8 75.7 76.6 83.1	2200	82.1		82.8	82.3	83.2	86.5	8		87.3	90.6	83.8	LST	82.8	76.1	76.3	83	83	82.4
	2300	81.4		82.1	81.5	82.2	85	88.4	85.1	85.3	89.1		LST		75.7	76.6	83.1	83.2	81.8

VI.6.1 Temperature Data (°F)—HRM-3

TIME 77.9 78.1 75.6 76.3 68.9 100 80.3 80.4 77 75.1 74 69.0 200 81.2 77.9 75.6 74.9 73.2 68.9 300 81 78.7 75.6 74.8 72.6 65.2 400 80.5 77.1 75.2 73.8 68.8 65.8 500 80.5 77.1 75.2 73.8 68.8 65.8 600 80.8 77.1 75.2 73.8 68.8 65.8 65.8 600 80.8 77.1 75.2 73.8 68.8 65.8 65.8 1000 80.8 77.2 85.1 86.1 77.4 77.4 1000 86.8 77.2 85.1 86.4 85.9 77.4 1100 90.5 75.4 85.1 86.4 85.3 77.4 1200 93.1 75.4 86.3 90.1 8		12-Sep	13-Sep	12-Sep 13-Sep 14-Sep 15-Sep	15-Sep	16-Sep 17-Sep	17-Sep
81.2 77.9 78.1 75.6 76.3 80.9 80.4 77 75.1 74 81 79.6 76.6 74.9 73.2 81 78.7 75.6 74.8 72.6 80.5 77.1 75.2 73.8 68.8 80.5 77.1 75.2 73.8 68.8 80.8 77.1 75.2 74.5 67.5 80.8 77.1 75.4 74.5 67.5 80.8 77.1 85.1 71.8 82.1 80.8 77.2 83.7 86.4 75.5 80.8 77.1 85.1 86.9 90.1 75.5 90.6 75.7 86.9 90.1 75.5 90.7 75.4 83.8 92.8 86.4 91 81 75.7 86.9 90.1 87.7 91 81 84.6 92.9 87.8 87.8 82.1 77.4	TIME						
80.9 80.4 77 75.1 74 81 79.6 76.6 74.9 73.2 81 78.7 75.6 74.8 72.6 80.5 77.1 75.2 74.3 70.4 80.5 77.1 75.2 73.8 68.8 80.8 77.1 75.2 73.8 68.8 86.8 77.2 83.7 66.1 77.8 86.8 77.2 83.7 86.1 77.8 86.8 77.1 85.1 86.4 75.5 86.8 77.2 83.7 86.4 75.5 90.6 75.7 86.9 90.1 82.3 91 75.3 87.4 92.8 86.4 91 75.3 87.8 87.8 87.8 91 77.4 87.8 81.3 88.2 85.1 77.7 80.8 81.3 77.1 85.1 77.2 81.8 77.1 81.8	0		6.77	78.1	75.6	26.3	68.9
81 79.6 76.6 74.9 73.2 80.5 78.1 75.6 74.9 73.2 80.5 77.1 75.2 73.8 68.8 80.5 77.1 75.2 73.8 68.8 80.5 77.1 75.2 73.8 68.8 80.8 76.8 76.8 74.5 67.5 86.8 77.2 83.7 86.1 71.8 86.8 77.2 85.1 86.9 79.3 86.8 77.2 86.9 90.1 82.3 90.7 75.4 85.9 90.1 82.3 90.7 75.4 83.8 92.8 86.4 90.7 75.4 83.8 92.8 86.4 90.7 75.4 83.8 92.8 86.4 90.7 75.4 83.8 92.8 86.7 80.5 77.4 81.5 88.7 77.1 85.1 77.7 81.8 77.1	100	80.9	80.4	77	75.1	74	69
81 78.7 75.6 74.8 72.6 80.5 77.1 75.2 74.3 70.4 80.6 77.1 75.2 73.8 68.8 80.8 76.8 75.4 74.5 67.5 80.8 76.8 75.4 74.5 67.5 86.8 76.7 79.6 82.1 71.8 86.8 77.2 83.7 86.1 75.5 86.8 77.1 85.1 86.4 75.5 90.6 75.7 86.9 90.1 82.3 91 75.3 87.4 91.9 86.4 90.7 75.4 83.8 92.8 86.4 91 84.6 92.9 87.8 87.8 89.5 77.4 84.4 92.8 88.2 89.5 77.4 84.5 92.8 88.2 85.1 77.7 80.8 81.3 82.7 85.1 77.7 80.8 81.3 77.1 </th <th>200</th> <th>81</th> <th>79.6</th> <th>76.6</th> <th>74.9</th> <th>73.2</th> <th>66.1</th>	200	81	79.6	76.6	74.9	73.2	66.1
80.5 78.1 75.3 74.3 70.4 80.8 77.1 75.2 73.8 68.8 80.8 76.8 75.4 74.5 67.5 83 76.8 76.8 78.1 69.1 86.8 77.2 83.7 86.1 71.8 86.8 77.2 83.7 86.9 79.3 90.6 75.7 86.9 90.1 82.3 90.7 75.4 83.8 92.8 86.4 90.7 75.4 83.8 92.8 86.4 90.7 75.4 83.8 92.8 86.2 90.7 75.4 83.8 92.8 86.2 89.5 77.2 84.6 91.8 87.7 89.5 77.4 81.5 88.8 81.3 85.1 77.7 80.8 86.1 77.1 81.6 78.5 77.1 81.8 77.8 81.6 77.2 81.8 77.1 81.6 77.2 81.8 77.8 81.6 78.5	300	81	78.7	75.6	74.8	72.6	65.2
80.5 77.1 75.2 73.8 68.8 80.8 76.8 75.4 74.5 67.5 80.8 76.8 76.8 76.9 67.5 67.5 86.8 77.2 83.7 86.9 77.8 86.9 77.8 86.4 77.1 85.1 86.9 90.1 82.3 86.4 90.6 75.7 86.9 90.1 82.3 86.4 92.3 86.4 90.7 75.4 83.8 92.8 86.4 87.7 86.2 86.4 87.7 91 86.7 84.6 92.9 87.8 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 86.2 87.7 87.8 87.8 87.8 87.8 87.8 87.8 87.8 87.8 87.8 87.8 87.8 87.3 87.8 87.8	400	80.5	78.1	75.3	74.3	70.4	65.8
80.8 76.8 75.4 74.5 67.5 83 76.8 76.8 78.1 69.1 86 76.7 79.6 82.1 71.8 86.8 77.2 83.7 86.1 75.5 88.4 77.1 85.1 88.6 79.3 90.6 75.7 86.9 90.1 82.3 91 75.3 87.4 91.9 84.7 91 75.3 84.6 92.9 87.8 91 84.6 92.9 87.8 87.8 89.5 79.5 84.6 92.8 87.8 85.1 77.7 80 86.1 77.1 85.1 77.7 80 86.1 77.1 81.6 78.5 83.7 77.1 81.6 78.5 83.7 77.1 81.6 78.5 77.2 81.8 75.8 82.1 78.5 77.2 81.8 75.8 82.2	200	80.5	17.7	75.2	73.8	8.89	65
83 76.8 76.8 76.8 76.9 69.1 86.8 77.2 83.7 86.1 71.8 88.4 77.1 85.1 88.6 79.3 90.6 75.7 86.9 90.1 82.3 90.7 75.4 83.8 90.8 84.7 91 75.3 87.1 91.9 84.7 91 75.4 83.8 92.8 86.4 91 84.6 92.9 87.8 86.2 89.5 79.5 84.3 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80. 86.1 77.1 81.6 78.5 83.7 77.1 81.6 77.2 81.8 75.8 79.5 78.5 77.2 81.8 75.8 79.5 78.6 78.9 78.9 78.9 79.3 78.6 78.3 68 73.8	009	80.8	76.8	75.4	74.5	5.79	64.2
86 76.7 79.6 82.1 71.8 86.8 77.2 83.7 86.1 75.5 88.4 77.1 85.1 88.6 79.3 90.6 75.7 86.9 90.1 82.3 93.1 75.3 87.1 91.9 84.7 90.7 75.4 83.8 92.8 86.4 91 78.9 84.6 92.9 87.8 89.5 79.5 84.6 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.5 83.7 77.1 81.6 77.2 81.8 75.8 81.6 77.2 81.8 75.8 81.6 78.5 83.7 77.1 81.6 78.5 78.8 78.8 81.6 78.9 78.9 78.8 82.1 78.6 78.9 78.8	700	83	76.8	8.92	78.1	69.1	2.99
86.8 77.2 83.7 86.1 75.5 88.4 77.1 85.1 88.6 79.3 90.6 75.7 86.9 90.1 82.3 93.1 75.3 87.1 91.9 84.7 90.7 75.4 83.8 92.8 86.4 91 78.9 84.6 92.9 87.8 89.5 79.5 84.6 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 77.1 81.6 78.5 83.7 77.1 81.8 75.8 79.5 78.5 77.2 81.8 75.8 75.8 79.5 78.6 77.7 81.8 75.8 75.8 79.5 78.6 78.9 75.8 75.8 75.8 79.5 78.6 78.9 75.8 75.8 75.8 77.4 78.5 77.9 75.8 75.8 7	800	98	76.7	9.67	82.1	8.17	71
88.4 77.1 85.1 88.6 79.3 90.6 75.7 86.9 90.1 82.3 90.7 75.4 87.8 92.8 84.7 90.7 75.4 83.8 92.8 86.4 91 78.9 84.6 92.9 87.8 81 78.5 84.4 92.8 86.2 89.5 79.5 84.3 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 77.1 81.6 78.5 77.2 81.8 75.8 79.5 78.5 77.2 81.8 75.8 79.5 78.6 78.9 78.9 78.9 77.4 78.5 78.9 78.9 78.9 79.5 78.6 78.9 78.9 78.9 77.4 78.5 78.9 78.9 78.9 77.4 78.5 78.9 78.9 78.9 </th <th>900</th> <th>86.8</th> <th>77.2</th> <th>83.7</th> <th>86.1</th> <th>75.5</th> <th>75.4</th>	900	86.8	77.2	83.7	86.1	75.5	75.4
90.6 75.7 86.9 90.1 82.3 93.1 75.3 87.1 91.9 84.7 90.7 75.4 83.8 92.8 86.4 91 78.9 84.6 92.9 87.8 91 81 84.4 92.8 87.8 89.5 79.5 84.3 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.5 78.5 81.3 77.1 81.6 78.5 83.7 77.1 81.6 78.5 83.7 77.1 81.6 78.5 78.8 75.8 79.5 78.6 78.9 75.8 77.4 78.5 78.9 75.8 77.4 78.5 78.9 75.8 85.1 78.5 78.9 75.8 85.2 78.5 78.9 78.9 85.2	1000	88.4	77.1	85.1	88.6	29.3	79.5
93.1 75.3 87.1 91.9 84.7 90.7 75.4 83.8 92.8 86.4 91 78.9 84.6 92.9 87.8 91 81 84.4 92.8 87.8 89.5 79.5 84.3 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 76.8 75.8 75.8 79.5 78.8 76.8 75.8 75.8 79.3 78.8 76.8 78.9 75.8 77.4 78.5 76.8 75.8 75.8	1100	90.6	75.7	6'98	90.1	82.3	82
90.7 75.4 83.8 92.8 86.4 91 81 84.6 92.9 87.8 91 81 84.4 92.8 86.2 89.5 79.5 84.5 91.8 87.7 85.1 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.5 78.6 78.9 73.8 73.8 77.4 78.5 76.8 73.9 73.8	1200	93.1	75.3	87.1	91.9	84.7	84
91 78.9 84.6 92.9 87.8 91 81 84.4 92.8 86.2 89.5 79.5 84.3 91.8 87.7 87.1 77.4 81.5 88.8 81.3 85.7 77.4 81.5 88.1 77.1 85.1 77.7 80 86.1 79.1 81.6 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.5 78.8 76.8 78.9 75.8 77.4 78.5 76.8 78.9 75.8	1300	90.7	75.4	83.8	92.8	86.4	85.9
91 84 92.8 86.2 89.5 79.5 84.3 91.8 87.7 87.1 78.2 84.6 91 85.7 85.7 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 76.8 75.8 75.8 79.3 78.8 76.8 78.9 73.8 77.4 78.5 76.8 78.3 68	1400	91	78.9	84.6	92.9	87.8	87
89.5 79.5 84.3 91.8 87.7 87.1 77.4 84.6 91 85.7 85.7 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 77.2 81.8 77.1 79.5 78.8 77.2 81.8 75.8 79.3 78.6 76.8 73.9 73.8 77.4 78.5 76 78.3 68	1500	91	81	84.4	92.8	88.2	87.6
87.1 78.2 84.6 91 85.7 85.7 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	1600	89.5	79.5	84.3	91.8	87.7	87.2
85.7 77.4 81.5 88.8 81.3 85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	1700	87.1	78.2	84.6	91	85.7	85.5
85.1 77.7 80 86.1 79.1 81.6 78.2 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	1800	85.7	77.4	81.5	88.8	81.3	79.3
79.5 78.2 78.5 83.7 77.1 79.5 78.8 77.2 81.8 75.8 79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	1900	85.1	77.7	80	86.1	79.1	74.2
79.5 78.8 77.2 81.8 75.8 79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	2000	81.6	78.2	78.5	83.7	77.1	1.1
79.3 78.8 76.8 79.9 73 77.4 78.5 76 78.3 68	2100	79.5	78.8	77.2	81.8	75.8	69.7
77.4 78.5 76 78.3 68	2200	79.3	78.8	76.8	79.9	73	67.2
	2300	77.4	78.5	92	78.3	89	29

VI.6.2 Wind Speed Data (mph)—HRM-3

VI.6.2 Wind Speed Data (mph)—HRM-3

	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	28-Aug 29-Aug 30-Aug 31-Aug 01-Sep		02-Sep	03-Sep 04-Sep	04-Sep	05-Sep	06-Sep 07-Sep		08-Sep	09-Sep	10-Sep	11-Sep
TIME																		
0	3.3	4.5	5.4	9.5	4.8	4.8	3.3	4.7	5.9	9.5	4.8	1.4	LST	1.4	4.2	3.4	7.5	5.5
100	0.4	4.1	3.9	5	6.2	3.6	2.7	3.8	4.7	6.1	3.6	6.0	LST	3.5	4.4	2.8	6.5	5.5
200	0.3	2.8	4.5	4.3	4.4	3.8	2.9	-	4.7	5.6	5	9.0	LST	3.8	3.9	2.1	6.3	5.2
300	1.8	1.1	4.5	3.6	2.2	4.1	3	1.6	3.5	5.8	4.6	0.5	LST	4.5	5.2	2	4.4	4.7
400	2.9	9.0	0.5	8.0	1.9	3.5	2.2	4.8	6.4	6.4	4.6	9.0	LST	3.8	4.4	3.3	1.9	3.5
200	2.2	6.0	1.9	9.0	1.3	3.5	3.4	3.6	4.8	6.4	8.3	0.4	LST	3.5	3.8	3.1	1.6	2.8
009	2.6	1	2.2	8.0	9.0	4.3	5.2	4	3.9	4.5	7.4	9.0	LST	1.9	4.1	2.9	2.7	4.7
200	3.1	2.9	6'0	0.4	1.4	5.5	9.8	8	5.3	2	7.2	3.1	LST	3.6	6.3	2.5	1.2	3.4
800	2	2.7	3.1	3.5	2.5	8.8	8.7	8.7	9.4	6.8	9.4	9.6	IST	5	6.5	0.7	4.7	5.1
300	1.2	3	3.8	4.7	3.5	8.1	8.5	7.8	8.2	9.8	9.4	9	IST	5	7	0.5	4.5	3.1
1000	3.3	3.4	5.6	3.7	3.9	7.2	7.3	7.9	6.3	7.4	7.5	9.5	FEW	6.7	2.9	0.4	4.8	2.5
1100	2.7	3.4	5.6	9	3.7	5.4	6.1	6.7	6.9	9	9	5	3.1	6.3	7.2	3.4	4.4	3.5
1200	4.8	3	5.9	6.1	2.6	3.5	3.2	5.8	4.8	5.8	5.2	5.6	5.1	7.1	9	3	8.7	4.8
1300	4.9	5.4	9.7	9	4	3.6	1.1	9	4.1	5.1	5.9	6.3	4.8	7.1	6.1	7.6	6.1	6.4
1400	6.7	7.2	9.9	10.3	4.3	8.0	1.7	7.6	1.8	2.7	7.2	4.2	5.1	5.9	5.5	9.2	7.3	7.9
1500	7.5	8.2	10.8	11.1	6.3	1.1	4.2	7.4	3.9	3	2.5	5.9	4.5	9	5.9	10	5.1	9
1600	9	9.1	11.4	11.8	9.8	3.5	5	5.8	2.5	3.9	8.2	3	5.3	8.8	6.1	11	2.2	8.9
1700	8	9.7	10.6	11.2	9.2	6.3	9.9	12.8	7.4	3.6	8.8	1.8	2.8	9.8	6.8	9.4	7.2	6
1800	7	9.1	10.2	9.9	10	9.1	4	6.4	10.3	5.1	8.8	1.7	2.4	6.9	5.1	8.2	Ŧ	8.7
1900	7.4	9.8	10.2	9.3	8.4	7.9	9	3.8	8.9	1.9	6.7	PMA	6.1	6.9	3.9	8.3	10.3	7.5
2000	7.8	7.2	8.1	8.2	5.2	7.4	7.7	0.2	8.4	1.7	5.8	PMA	5.4	6.5	3.4	6.1	7.5	8
2100	8	5.9	6.9	6.4	6.1	6.2	6.4	3.2	7.4	1.9	4.2	PMA	3.6	5.4	3.6	4.6	7	6.9
2200	5	5.9	9.9	5.9	6.4	5.2	4.3	9.0	8.2	4.8	3.6	LST	1.6	4.2	3.2	7	6.2	5
2300	4.8	4.2	6.3	4.6	4	4.5	4.7	6.2	6.4	5.2	1.1	LST	0.9	4.4	3.2	7.2	7.2	5

VI.6.2 Wind Speed Data (mph)—HRM-3

:	12-Sep	13-Sep	14-Sep	15-Sep	14-Sep 15-Sep 16-Sep 17-Sep	17-Sep
TIME						
0	4.5	2.4	2.6	2.9	2.4	3.2
100	4.2	7.7	3.5	4.2	2.8	3.6
200	4.9	5.4	3.5	3.4	3.1	2.6
300	6.1	3.7	3.7	3.1	3.1	2.8
400	5.2	5.6	3.6	3	3.3	4
500	5.7	5.1	2.7	4.5	4.4	4.1
009	4.2	2.6	3.7	4.2	9	4.4
700	4	4	2.4	5.4	7.7	S
800	3.1	3.4	2.2	9.9	7.4	8.4
900	2.6	3.6	1.8	7.7	7.7	4.1
1000	2.5	4.5	2.3	9	6.8	4.1
1100	1.9	1.3	3.8	5.5	7.7	5.4
1200	3.3	1.5	5.5	6.5	7.2	4.8
1300	8.8	2.2	2	5	6.8	5.5
1400	7.4	3.1	3.7	4	6.1	5.1
1500	7.4	4.7	3.9	4.3	9.9	4.6
1600	8.5	2.8	2.3	3.3	9	3.2
1700	6.6	1.6	3.3	5	3.4	2.9
1800	4.9	1.3	1.9	5.8	2.6	3.2
1900	9	2.8	3.6	9.9	3.4	2.1
2000	5.5	2.5	3.5	6.7	2.9	0.3
2100	5.1	2.6	2.1	5.5	2.7	0.7
2200	3	3.1	3.5	4	2.2	LIM
2300	2.9	2.6	4.2	3.3	2.1	M

VI.6.3 Wind Direction (0-359 degrees)—HRM-3

23-Aug 24-Aug		37	19	12	28	22	1	18	11		321	-													
J 23-A		183	97	71	33	37	25	71	72	۶	3	+		++-											
g 22-Aug		186	202	196	203	351	18	28	22	12		12	12	12 18 277	12 18 14	12 277 277 33	12 18 14 14 14 28 33 33 33 33 33 33 33 33 33 33 33 33 33	12 18 18 14 14 14 15 28 28 28 75 75 75	12 14 14 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15	123 123 123 123 123	12 17 17 17 17 17 17 17 17 17 17 17 17 17	12 12 12 12 12 12 13 13 13 14 15 17 17 17 17 17 17 17 17 17 17 17 17 17	12 123 128 129 129 126	123 123 123 123 123 123 123 123	128
21-Au		191	198	202	202	216	242	283	283	312		344	34	34 4 20 168	344 20 168 118	344 20 168 118 118	344 20 20 168 118 118 130	20 20 118 118 130 130 130 130 130 130 130 130 130 130	20 20 118 118 1190 130 130 130 130 130 130 130 130 130 13	344 20 20 168 118 130 130 129	344 20 20 168 118 130 130 130 129 142	344 20 20 1168 118 130 130 129 142 147	344 20 20 1168 118 118 130 130 129 129 142 142 179	344 168 118 118 130 130 129 179 179	20 168 118 118 130 130 129 179 179 179 179 179
20-Aug		197	198	193	200	252	275	297	326	274		254	254	254 262 241	25 24 25 254 254 254	254 262 241 257 161	254 262 241 257 161 161	254 241 241 257 257 158 158	254 262 241 257 257 161 161 175 142	254 262 241 241 257 161 161 142 142	254 262 262 241 241 161 161 175 142 142	254 241 241 241 161 161 142 142 176	254 262 262 241 241 158 142 142 142 167 176	252 262 241 241 257 158 158 142 142 176 186 190	252 262 262 27 257 257 257 158 142 142 142 167 167 167 167 168 168 168 168
19-Aug 20-Aug 21-Aug		193	215	220	238	230	270	307	257	257		210	220	220 202	210 220 202 214	210 202 214 214 184	210 220 202 214 184 147	210 220 202 214 184 147	210 202 202 214 184 147 143	210 220 202 214 214 184 147 143 140	210 220 202 214 184 147 143 140 140	210 220 202 214 184 147 140 140 166	210 220 202 214 184 147 140 140 166 185	210 220 202 214 184 147 143 140 140 185 188	210 220 202 214 184 147 143 140 140 140 188 188
18-Aug		195	203	207	262	285	285	294	265	256	27.0	724	205	205 194	205 194 204	205 205 194 204 196	205 205 194 204 196 150	205 205 194 204 196 150 135	205 205 194 204 196 150 131	205 194 194 196 150 135 135	205 194 204 196 150 131 131 158	205 206 194 204 196 150 131 131 155 168	205 205 194 204 196 150 131 131 168 168 176	205 194 204 196 150 150 131 155 168 176 176	205 204 194 196 150 150 131 131 168 168 175 175
17-Aug		238	247	254	250	259	262	282	280	287	293		287	287	287 261 185	287 261 185 166	287 261 185 166 123	287 261 185 166 123 131	287 261 185 166 173 140	287 261 185 166 173 140 140	287 261 185 166 123 131 140 142	287 261 185 166 123 131 140 140 150	287 261 185 166 173 140 140 142 150 175	287 261 185 166 173 140 142 173 173 173 189	287 261 185 166 173 140 140 140 170 173 188
15-Aug 16-Aug 17-Aug 18-Aug		231	240	240	275	278	274	262	276	262	283		276	276 290	276 290 274	276 290 274 213	276 290 274 213 233	276 290 274 213 233 305	276 290 274 213 233 305 139	276 290 274 213 233 305 139	276 290 274 213 306 139 145	276 290 274 213 233 305 139 145 157	276 290 274 273 305 305 139 145 157 163	276 290 274 273 273 305 139 145 163 185 199	276 290 274 273 306 306 139 145 157 163 185 199 224
15-Aug		172	178	169	181	185	201	193	134	150	161		120	120	120 133	120 116 133	120 133 135 141	133 133 141 161	120 133 135 141 161	116 135 135 141 161 161 161	116 113 113 113 113 113 113 113	120 135 135 141 161 161 173 173 173	120 133 133 141 161 161 175 175	120 133 133 141 161 161 163 175 175 185	120 135 135 137 141 161 161 175 173 173 173 173 173 173 173 173 173 173
14-Aug		138	122	116	125	83	354	23	99	101	131	_	127	137	127 135 133	135 133 133	135 133 137	135 133 137 137	135 133 133 137 140	135 133 133 140 140	135 133 133 137 140 140	135 133 133 137 140 140 140	127 133 133 140 140 140 138	127 133 133 140 140 140 142 138 133	133 133 133 140 140 140 120 120 120
3-Aug		244	273	345	359	336	342	332	319	327	5		2	2 05	5 03 23	20 20 72	5 8 2 5 88	50 23	50 50 77 71 111 111 1132	50 20 11 11 12 12 12 12	50 50 71 71 11 13 12 12 12 12 12 12 13	50 64 64 111 112 128 130	50 64 64 64 132 128 130 130	50 64 64 64 64 11 11 12 12 13 13 13 13 13 13 13 13 13 13	50 64 64 64 111 111 112 128 130 130
12-Aug 13-Aug		81	354	21	17	54	10	36	44	22	7	~	,	, Q	20 40	205 20	2 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	9 68 98 88	29 88 40 40 429 439	40 50 76 68 99 129 146	50 40 76 68 99 99 123 123	40 40 40 68 68 99 129 148 148	40 40 40 40 40 40 40 40 40 40 40 40 40 4	40 40 40 40 40 40 40 40 40 40 40 40 40 4	40 40 50 50 68 68 99 99 1123 1123 1146 1146 1148 1192 1148
11-Aug 1		233	526	262	265	285	302	291	291	295	290	228	1	2g	240	240 245 245	240 245 245 264	245 245 207 207	245 245 264 207 207 202	240 207 207 207 202 173	240 207 207 207 202 202 202 69	240 207 207 202 202 202 173 69 135	240 207 207 207 202 173 69 69 17	240 207 207 207 202 202 202 1173 69 69 135 207 207 207 207 207 207 207 207 207 207	240 207 207 202 202 202 202 203 173 173 173 173 313 313
10-Aug 1		189	222	230	245	285	294	13	355	267	257	270		177	177	177 256 208	177 256 208 180	177 208 208 180 125	177 256 208 180 125 143	177 256 208 180 125 143	177 256 208 180 125 143 176	177 236 208 180 125 143 176 176	177 256 208 180 125 143 176 176 187 184	177 256 208 180 180 175 176 184 184	177 208 208 180 125 143 176 184 188 198
09-Aug		177	188	195	203	215	200	166	154	176	165	186		150	150	150 120 145	150 120 145 119	150 120 145 119 118	150 120 145 119 129	150 120 145 119 129 124	150 120 145 119 129 129 129	150 120 145 119 129 124 127 137	150 145 145 119 128 124 125 137	150 120 145 118 129 124 124 137 175 175	150 145 145 119 129 129 137 177 177
08-Aug		176	176	178	152	184	134	141	144	162	152	170		133	142	142 141	133 142 171	133	133 141 171 169 173	133 141 171 169 174 174	133 171 171 173 173 173 173	133 171 171 173 173 1459 140	133 142 171 171 173 173 140 140	133 142 171 174 173 174 140 149 166	133 142 171 171 173 173 140 140 140 177 177
07-Aug (193	192	195	188	197	210	229	191	184	118	111		114	114	134 138	134 138	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	44 13° 13° 14° 14° 14° 14° 14° 14° 14° 14° 14° 14	114 134 134 134 144 144 144 144 144 144	134 138 134 134 134 134 134 134 134 134 134 134	13 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	14 13 13 13 15 15 15 15 15 15 15 15 15 15 15 15 15	128 133 134 134 149 149 150 150 150 169 169 169 169 169 169 169 169 169 169	114 138 138 138 138 141 143 143 143 143 169 169
THE CHARGE THE REAL PROPERTY.	TIME	0	20	200	300	400	900	009	200	800	900	900	1100		200	200	200 300 400	300 300 500	300	1300 1300 1400 1500	200 300 1400 1500 1700	1306 1400 1500 1700	1200 1300 1400 1500 1700 1800 1800	1200 1300 1400 1500 1700 1700 1900 2100	1200 1300 1400 1400 1500 1800 1800 2000 2100

VI.6.3 Wind Direction (0-359 degrees)—HRM-3

100. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. 7.1. <th< th=""><th>de salleyddonaandedda 'n sa henryste'n da s</th><th>25-Aug</th><th>26-Aug</th><th>27-Aug</th><th>28-Aug</th><th>29-Aug</th><th>30-Aug</th><th>31-Aug</th><th>01-Sep</th><th>02-Sep</th><th>03-Sep</th><th>04-Sep</th><th>05-Sep</th><th>05-Sep 06-Sep 07-Sep</th><th>07-Sep</th><th>08-Sep</th><th>09-Sep</th><th>10-Sep</th><th>11-Sep</th></th<>	de salleyddonaandedda 'n sa henryste'n da s	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	05-Sep 06-Sep 07-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
210 210 194 196 197 236 246 237 243 246 247 64 251 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 247 248 248 248 248 248 248 248 248 248 248 248 248 248 248 248 248	TIME																		
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44 556 567 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569 569	100	111	220	202	202	194	272	260	251	245	251	235	270	LST	77	44	33	149	189
4 306 195 216 217 286 217 286 284 285 284 285 284 285 284 285 286 286 286 286 286 286 286 286 286 286 286 286 286 286 286 286 286 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287 287	200	207	259	201	194	191	268	262	269	261	254	224	271	LST	82	46	526	183	207
44 3 5 5 246 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 275 250 275 275 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 276 277 276	300	-	306	195	216	217	366	271	366	249	265	241	366	LST	78	50	35	198	200
44 3 280 346 280 287 247 280 284 340 286 280 347 280 284 280 284 280 281 281 282 281 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282 282	400	27	10	285	259	285	260	270	253	245	279	280	5	LST	73	25	23	191	189
34 5 283 35 17 302 283 270 244 267 292 27 LST 43 38 34 194 23 286 283 284 285 286 287 276 286 286 7 LST 67 27 20 40 208 287 282 274 201 16 LST 67 27 20 40 208 67 27 283 274 201 16 LST 67 17 LST 276 282 276 275 276 18 17 18 18 18 18 18 18 18 18 18 18 18 276 275 276 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18	200	44	3	290	348	298	366	260	257	247	280	284	310	LST	62	48	53	190	192
23 286 287 284 289 289 7 LST 57 57 60 40 208 30 286 136 289 289 272 283 274 301 16 LST 65 25 34 188 61 212 286 139 276 282 275 376 186 18 LST 29 375 365 18 LST 29 39 189 286 287 286 186 18 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189 189	009	34	5	293	35	17	302	283	270	244	267	292	71	LST	43	38	34	194	192
30 266 198 208 228 372 263 274 301 16 LST 65 284 384 188 272 283 274 301 276 275 275 305 18 181 181 65 184 187 284 303 276 276 276 376 186 187 186 187 287 287 287 286 186 187 289 287 287 286 189 189 189 189 189 189 189 189 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180	700	23	296	293	294	293	306	297	276	244	269	296	7	LST	25	20	010	208	233
61 212 208 197 236 296 307 276 275 305 18 LST 276 276 276 316 18 LST 236 289 302 276 276 376 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18	800	99	256	138	203	228	302	233	272	263	274	301	16	LST	99	25	34	188	199
40 208 177 212 217 311 306 257 276 276 326 48 FEW 28 33 192 190 128 158 168 302 289 256 287 266 18 18 49 29 33 18 18 18 18 18 48 89 29 33 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18<	900	64	212	208	197	236	238	303	276	292	275	305	18	LST	23	19	222	200	205
62 168 169 169 269 256 297 269 179 189 189 39 31 189 39 31 48 49 39 31 81 181 181 113 113 153 169 215 280 256 290 279 13 20 30 31 53 110 123 149 113 142 152 282 276 279 279 48 89 62 69 130 151 151 151 151 151 152 274 282 273 48 89 62 69 152 151 151 151 151 151 274 275 273 48 89 62 69 152 274 275 273 173 48 89 174 174 174 174 174 174 174 174 174 174 174 <t< th=""><th>1000</th><th>9</th><th>208</th><th>177</th><th>212</th><th>217</th><th>311</th><th>306</th><th>257</th><th>276</th><th>276</th><th>325</th><th>8</th><th>FEW</th><th>28</th><th>33</th><th>192</th><th>190</th><th>33</th></t<>	1000	9	208	177	212	217	311	306	257	276	276	325	8	FEW	28	33	192	190	33
138 159 169 216 280 250 270 170 170 30 31 53 110 123 113 117 142 152 282 50 232 271 277 50 26 104 38 65 116 151 149 149 142 145 145 146 33 193 224 289 72 48 89 65 69 152 166 151 137 136 144 148 33 193 240 229 72 48 91 70 68 132 166 144 140 141 148 141 204 257 209 229 173 105 61 141 15 144 140 146 147 204 257 209 139 103 103 103 103 103 103 103 103 <	1100	62	168	193	165	268	302	289	256	297	366	18	18	49	29	33	84	181	70
143 142 152 282 50 232 271 277 50 28 104 38 65 116 151 142 142 142 142 143 143 145 146 148 147 284 274 289 72 48 91 70 68 132 146 141 204 272 289 72 48 91 70 68 132 146 147 148 141 204 277 209 229 730 173 143 145 147 147 148 141 204 277 209 229 130 113 140 147 141 142 142 143 144 144 204 277 209 130 143 145 144 144 144 144 144 144 144 145 145 144 145 144 145 144 145 144 1	1200	128	173	159	169	215	280	328	258	230	279	13	20	8	ઝ	53	110	123	74
149 119 133 134 175 8 236 224 249 282 73 48 89 62 69 132 166 137 135 131 142 148 33 193 240 220 239 72 48 91 70 68 132 27 144 140 163 141 148 141 204 257 209 229 130 113 105 61 141 15 141 144 140 169 146 147 204 257 209 229 130 113 105 61 141 15 144 140 169 176 176 176 176 174 144 142 55 117 145 147 147 142 85 117 140 147 142 142 142 142 142 142 142 142 144	1300	113	117	142	152	222	282	20	232	27.1	277	20	76	104	88	65	116	151	137
137 153 146 148 33 193 240 220 239 72 48 91 70 68 132 271 137 153 148 141 144 204 257 209 229 130 103 103 61 141 15 144 140 169 158 146 145 146 174 241 142 55 111 101 73 147 147 147 148 147 148 147 146 147 146 147 147 142 55 141 147 147 147 147 147 147 147 147 147 147 148 147 148 147 147 148 147 148 147 148 148 148 148 148 149 148 148 148 148 148 148 148 148 148 148 1	1400	149	119	133	134	175	ω	236	224	249	282	73	48	88	62	69	132	166	144
137 153 148 141 148 141 204 257 209 130 103 113 105 61 141 15 144 140 169 158 165 145 185 9 140 265 139 82 107 103 69 140 147 133 157 176 176 176 176 177 178 170 175 145 147 147 142 55 111 101 73 145 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 145 147 148 147 148 147 148 148 148 148 148 148 148 148 148 <t< th=""><th>1500</th><th>137</th><th>135</th><th>134</th><th>142</th><th>148</th><th>83</th><th>193</th><th>240</th><th>220</th><th>239</th><th>72</th><th>48</th><th>91</th><th>70</th><th>88</th><th>132</th><th>271</th><th>150</th></t<>	1500	137	135	134	142	148	83	193	240	220	239	72	48	91	70	88	132	271	150
144 140 169 158 145 140 265 139 82 107 103 69 140 147 133 157 170 176 176 176 211 351 174 241 142 55 111 101 73 127 145 145 142 55 111 101 73 145 145 146 142 55 111 101 73 145 145 145 147 145 147 145 147 142 55 111 101 73 147 145 147 145 147 147 145 147 145 147 147 148 147 144 148 147 144 148 144 148 144 148 144 148 144 148 144 148 144 148 144 148 144 148 144 148 144 148 <t< th=""><th>1600</th><th>137</th><th>153</th><th>148</th><th>141</th><th>148</th><th>141</th><th>204</th><th>257</th><th>209</th><th>229</th><th>130</th><th>103</th><th>113</th><th>105</th><th>61</th><th>141</th><th>15</th><th>138</th></t<>	1600	137	153	148	141	148	141	204	257	209	229	130	103	113	105	61	141	15	138
133 157 170 176 176 176 176 176 176 177 185 176 177 176 177 177 185 171 185 177 185 177 186 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 184 188 188 188 188 188 188 188 188 188 188 188 188 188 188 188 188 188 188 188 <th>1700</th> <th>4</th> <th>140</th> <th>169</th> <th>158</th> <th>166</th> <th>145</th> <th>185</th> <th>8</th> <th>140</th> <th>265</th> <th>139</th> <th>82</th> <th>107</th> <th>103</th> <th>69</th> <th>140</th> <th>147</th> <th>140</th>	1700	4	140	169	158	166	145	185	8	140	265	139	82	107	103	69	140	147	140
161 170 172 171 185 191 203 203 215 165 167 167 185 191 202 73 215 84 187 PMA 128 86 56 127 179 189 182 185 186 186 211 233 80 216 233 201 PMA 118 85 51 117 156 185 183 183 186 120 231 253 206 LST 77 79 42 141 165 185 184 180 180 230 258 278 LST 77 79 42 141 165	1800	133	157	170	176	179	176	211	354	174	241	142	55	111	101	73	127	145	164
188 182 175 176 187 185 222 73 215 84 187 PIMA 128 86 56 127 179 179 189 194 168 196 211 233 80 216 233 201 PIMA 118 85 51 117 156 195 193 206 233 248 120 231 253 206 LST 77 79 42 141 165 195 194 130 134 237 256 246 190 230 258 278 LST 77 79 41 139 164	1900	161	170	172	171	185	191	203	203	203	215	165	PMA	122	87	ස	136	147	156
189 194 168 188 196 211 233 80 216 233 201 PMA 118 85 51 117 156 195 193 183 183 206 233 246 120 230 258 278 LST 77 79 42 141 165 195 194 130 136 130 230 258 278 LST 50 73 41 139 164	2000	28	182	175	176	187	195	222	73	215	84	187	PMA	128	88	26	127	179	169
195 193 183 183 206 233 248 120 231 253 206 LST 77 79 42 141 165 195 194 180 184 237 256 246 190 230 258 278 LST 50 73 41 139 164	2400	88	194	88	88	196	211	233	8	216	233	201	PMA	118	85	51	117	156	169
195 194 130 194 237 252 246 190 230 258 278 LST 50 73 41 139 164	2200	195	193	<u>≅</u>	2 8	206	233	248	120	231	253	206	LST	77	73	42	141	165	163
	2300	195	194	130	194	237	252	246	190	230	258	278	LST	20	73	41	139	164	181

VI.6.3 Wind Direction (0-359 degrees)—HRM-3

	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep
TIME						
0	199	81	48	330	53	34
100	200	136	24	343	42	40
200	198	127	17	315	47	35
300	187	80	24	315	48	36
400	198	90	29	320	33	41
200	192	83	27	300	26	39
009	186	69	29	316	24	36
700	210	21	75	340	29	36
800	149	49	49	350	26	30
006	123	337	42	352	26	48
1000	112	30	121	350	29	43
1100	126	18	132	354	26	33
1200	107	306	129	22	22	28
1300	109	8	276	355	31	26
1400	120	69	3	331	30	17
1500	113	97	84	330	25	20
1600	126	88	88	304	32	72
1700	125	96	38	13	99	89
1800	113	73	351	24	45	97
1900	117	78	334	27	43	109
2000	54	73	356	32	40	159
2100	7.7	77	359	38	52	331
2200	30	78	335	61	22	LIM
2300	14	74	304	99	34	LIM

VI.6.4 Ozone (ppb)—HRM-3

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24-Aug		2	þ	3	3	3	3	3	Ł	33	47	28	W	1.1	69	40	22	20	23	18	11	4	3	3	15
23-Aug		12	10	SPN	SPN	5	2	3	9	11	18	17	26	38	88	51	48	58	42	30	30	24	13	23	13
22-Aug		13	21	21	27	15	3	3	6	22	35	44	49	43	45	52	56	58	46	38	34	33	36	29	23
21-Aug 22-Aug 23-Aug 24-Aug		10	10	14	13	8	7	4	11	80	12	26	38	104	114	92	102	89	42	26	19	15	15	12	ھ
19-Aug 20-Aug		19	24	SPN	NGS	12	12	9	11	22	31	37	44	54	56	90	67	49	29	18	16	12	13	10	10
19-Aug		30	27	28	17	22	20	5	21	40	54	71	74	73	74	81	71	56	53	38	31	26	28	21	15
18-Aug		AGI	AQI	AQI	AQI	AQI	AQI	AGI	AQI	AGI	AGI	AGI	CAL	CAL	CAL	69	89	53	43	42	29	21	19	18	22
17-Aug		9	4	7	6	5	4	4	7	8	13	19	33	QAS	AQI	AGI	AGI	AQI	AGI	AQI	AGI	AG	AGI	AGI	AGI
16-Aug		8	5	NdS	SPN	9	3	4	9	12	12	17	26	38	54	QAS	QAS	CAL	CAL	CAL	9	7	7	2	6
15-Aug		4	6	7	11	12	11	7	8	12	16	19	22	31	30	23	17	16	14	8	5	12	10	10	6
14-Aug 15-Aug		16	20	71	25	10	2	3	8	22	22	24	27	36	26	26	26	23	13	6	7	5	11	8	5
13-Aug		41	37	SPN	SPN	16	11	10	32	43	56	99	62	64	69	70	75	83	%	70	50	37	34	35	13
12-Aug		2	2	2	2	2	2	3	17	47	94	92	100	104	80	70	71	79	29	48	8	32	27	35	46
11-Aug 12-Aug		7	10	7	11	6	2	4	9	11	12	17	30	47	64	88	101	105	88	53	38	28	16	14	7
10-Aug		9	8	5	5	5	2	2	5	9	20	55	87	97	93	100	113	90	70	40	18	6	9	12	8
09-Aug		11	7	SPN	SPN	11	9	4	7	16	22	32	37	48	51	20	44	28	24	12	2	4	9	5	5
08-Aug		12	9	7	3	4	3	7	11	15	19	26	25	21	22	21	21	20	17	12	8	5	~	10	11
07-Aug		6	7	5	5	9	4	3	12	17	18	27	35	42	42	ස	98	32	23	18	15	=	4	က	9
	ш	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
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VI.6.4 Ozone (ppb)—HRM-3

11-Sep		11	10	14	11	11	4	5	2	24	22	15	18	21	19	19	28	20	10	7	5	9	9	5	5
10-Sep		10	15	SPN	28	9	8	15	26	29	38	40	42	48	40	36	36	27	24	18	14	15	10	12	13
09-Sep		5	5	9	က	2	2	3	5	17	18	23	36	81	53	44	41	31	21	22	10	7	18	6	8
08-Sep		AGI	AGI	AQI	AGI	AQI	AGI	AQI	AGI	AQI	AGI	AQI	AGI	AGI	AGI	AQI	CAL	CAL	CAL	15	9	5	7	9	5
07-Sep		AQI	AQI	AGI	AGI	AGI	AGI	AQI	AGI	AQI	AQI	AQI	AQI	AGI	AQI	AGI	AQI	AQI							
06-Sep		IST	LST	LST	LST	LST	LST	LST	TST	LST	LST	AGI	AQI	AQI	AQI	AGI	AGI	AGI	AGI						
05-Sep 06-Sep 07-Sep		36	14	0	0	0	0	0	2	19	92	87	33	107	101	130	107	77	87	54	PMA	PMA	PMA	LST	LST
04-Sep		11	5	1	4	19	5	3	15	34	69	59	98	92	98	75	75	76	75	I M	47	61	59	41	38
03-Sep		8	10	SPN	SPN	16	13	9	12	16	23	36	99	75	87	92	97	98	96	72	54	37	16	12	8
02-Sep		15	18	13	17	23	18	17	18	31	39	90	29	84	87	92	100	104	62	31	33	23	23	15	12
01-Sep		29	30	20	13	17	13	5	12	QAS	23	39	95	76	96	88	88	84	62	38	23	7	18	3	13
31-Aug		13	11	9	3	1	1	2	9	13	24	37	99	82	97	118	134	157	134	88	55	32	36	17	23
30-Aug		15	13	SPN	SPN	5	5	3	5	11	16	29	44	ន	76	85	88	90	108	65	35	26	14	12	18
29-Aug		9	14	13	9	2	2	2	5	13	27	34	42	55	83	101	87	ន	48	30	19	12	19	11	9
28-Aug		10	11	5	7	4	2	2	8	23	31	40	44	46	51	45	41	32	23	15	13	12	12	13	8
27-Aug 28-Aug		17	13	SPIN	SPN	10	3	10	13	26	36	41	46	84	47	42	37	27	77	17	14	12	8	7	7
26-Aug		16	13	7	5	3	2	3	10	19	27	59	46	55	80	76	67	S	뚕	20	17	13	#	12	80
25-Aug		12	9	9	2	2	2	3	8	20	36	74	106	119	114	88	52	4	23	1	Ξ	19	18	14	12
tanana (anno anno anno anno anno anno ann		0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
	뿔	***																							

VI.6.4 Ozone (ppb)—HRM-3

TIME						
-						
0	4	9	2	3	32	27
100	4	9	2	6	24	45
200	4	SPN	3	2	31	SPN
300	5	SPN	2	2	34	SPN
400	9	10	2	2	30	35
200	3	7	2	2	16	32
009	3	4	2	2	13	58
700	11	4	4	9	28	37
800	17	5	7	13	33	33
006	15	5	21	17	40	25
1000	37	7	35	30	49	29
1100	58	7	46	32	55	62
1200	29	4	47	47	61	85
1300	40	QAS	40	99	62	09
1400	33	QAS	37	99	62	62
1500	41	26	28	68	61	62
1600	25	18	21	61	58	59
1700	18	5	20	48	55	57
1800	23	3	12	50	36	50
1900	17	5	7	44	34	18
2000	20	3	7	41	23	5
2100	20	5	3	40	36	8
2200	13	9	3	41	30	2
2300	10	3	2	36	8	1

VI.7 SPECIATE DATA

- VI.7.1 Profile—Forest Prescribed Burning-Broadcast Conifer
- VI.7.2 Profile—Meat Cooking-Charbroiling
- VI.7.3 Profile—Meat Cooking-Frying
- VI.7.4 Profile—Vegetative Detritus

VI.7.1 Profile—Forest Prescribed Burning-Broadcast Conifer

	PM 2.5 %	UNCERTAINTY
CONSTITUENT		
Nitrates	0.359	0.23
Sulfates	0.167	0.06
Organic Carbon	64.858	4.315
Elemental Carbon	6.942	4.393
Aluminum	0.046	0.018
Silicon	0.054	0.017
Phosphorus	0.06	0.025
Sulfur	0.171	0.116
Chlorine	0.239	0.179
Potassium	0.782	0.639
Calcium	0.072	0.039
Titanium	0.004	0.002
Vanadium	0.001	0.001
Chromium	0.002	0.001
Manganese	0.011	0.007
Iron	0.009	0.003
Nickel	0.002	0.001
Copper	0.002	0.002
Zinc	0.046	0.028
Bromine	0.009	0.006
Silver	0.019	0.009
Cadmium	0.031	0.015
Tin	0.018	0.015
Lead	0.01	0.009

VI.7.2 Profile—Meat Cooking-Charbroiling

	PM 2.5 %	UNCERTAINTY
CONSTITUENT		
Aluminum	0.08	0
Silicon	0.11	0
Phosphorus	0.1	0
Potassium	0.16	0
Calcium	0.057	0
Titanium	0.01	0
Vanadium	0.003	0
Chromium	0	0
Manganese	0	0
Iron	0.071	0
Nickel	0.007	0
Copper	0.34	0
Zinc	0.22	0
Arsenic	0.002	0
Selenium	0.001	0
Bromine	0.009	0
Rubidium	0	0
Strontium	0.004	0
Barium	0.2	0
Lead	0.027	0
Elemental Carbon	0	0
Organic Carbon	58.8	0
Magnesium	0.91	0
Sodium	0.23	0
Chlorine	0.37	0
Nitrates	0.02	. 0
Sulfates	0.21	0
Ammonium	0	0

VI.7.3 Profile—Meat Cooking-Frying

	PM 2.5 %	UNCERTAINTY
CONSTITUENT		
Aluminum	0	0
Silicon	0	0
Phosphorus	0	0
Potassium	0.36	0
Calcium	0.15	0
Titanium	0	0
Vanadium	0	0
Chromium	0.15	0
Manganese	0.041	0
Iron	0.24	0
Nickel	0.049	0
Copper	0	0
Zinc	0	0
Arsenic	0	0
Selenium	0.006	0
Bromine	0.084	0
Rubidium	0.09	0
Strontium	0.01	0
Barium	0.46	0
Lead	0.2	0
Elemental Carbon	0	0
Organic Carbon	57.4	0
Magnesium	0	0
Sodium	0.45	0
Chlorine	3.52	0
Nitrates	2.08	0
Sulfates	0.91	0
Ammonium	0	0

VI.7.4 Profile—Vegetative Detritus

	PM 2.5 %	UNCERTAINTY
CONSTITUENT		
Aluminum	2.57	0
Silicon	8.35	0
Phosphorus	0.3	0
Potassium	1.67	0
Calcium	2.29	0
Titanium	0.27	0
Vanadium	0.018	0
Chromium	0.054	0
Manganese	0.061	0
Iron	2.77	0
Nickel	0.073	0
Copper	2.25	0
Zinc	1.34	0
Arsenic	0.002	0
Selenium	0.003	0
Bromine	0.007	0
Rubidium	0.008	0
Strontium	0.026	0
Barium	0.31	0
Lead	0.18	0
Elemental Carbon	0.94	0
Organic Carbon	32.4	0
Magnesium	0.5	0
Sodium	0.05	0
Chlorine	0.09	0
Nitrates	0.38	0
Sulfates	0.39	0
Ammonium	0.019	0

VI.8 AIRS DATA

- VI.8.1 Elemental Composition—Aldine-18 August
- VI.8.2 Elemental Composition—Aldine-19 August
- VI.8.3 Elemental Composition—Aldine-25 August
- VI.8.4 Elemental Composition—Galveston-20 August
- VI.8.5 Elemental Composition—Galveston-22 August
- VI.8.6 Elemental Composition—Conroe-30 August
- VI.8.7 Elemental Composition—HRM-3-5 September
- VI.8.8 Elemental Composition—HRM-3-6 September
- VI.8.9 Elemental Composition—HRM-3-7 September
- VI.8.10 Elemental Composition—HRM-3-8 September
- VI.8.11 Elemental Composition—HRM-3-13 September

VI.8.1 Elemental Composition—Aldine-18 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Antimony	0.00555	0.02857
Arsenic	0.00334	0.01720
Aluminum	0.362	1.86368
Barium	0.0294	0.15136
Bromine	0.00273	0.01405
Copper	0.00311	0.01601
Cerium	0.00862	0.04438
Gallium	0.00057	0.00293
Iron	0.303	1.55993
Hafnium	0.0073	0.03758
Lead	0.00137	0.00705
Manganese	0.00617	0.03176
Molybdenum	0	0.00000
Nickel	0.00132	0.00680
Mercury	0.00085	0.00438
Gold	0	0.00000
Lanthanum	0.0111	0.05715
Niobium	0.00165	0.00849
Selenium	0.00033	0.00170
Tin	0.00909	0.04680
Titanium	0.0256	0.13180
Vanadium	0.00127	0.00654
Silicon	0.884	4.55108
Silver	0	0.00000
Zinc	0.0183	0.09421
Strontium	0	0.00000
Sulfur	2.17	11.17178
Tantalum	0.00532	0.02739
Terbium	0.00151	0.00777
Rubidium	0	0.00000
Potassium	0.159	0.81858
Yttrium	0.00052	0.00268
Zirconium	0.00193	0.00994
Ammonium	0.956	4.92176
K+	0.155	0.79798
Organic Carbon	4.6	23.68210
Total Nitrate	0.655	3.37213
Elemental Carbon	0.543	2.79552
Sulfate	8.49	43.70893
TOTAL	19.42395	100

VI.8.2 Elemental Composition—Aldine-19 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Arsenic	0.00203	0.00768
Aluminum	0.0265	0.10027
Barium	0.0271	0.10254
Bromine	0.00235	0.00889
Cadmium	0.00075	0.00284
Copper	0.00174	0.00658
Cesium	0.00913	0.03455
Gallium	0.00057	0.00216
Iron	0.108	0.40865
Hafnium	5.00E-05	0.00019
Lead	0.00353	0.01336
Manganese	0.0041	0.01551
Iridium	0.00141	0.00534
Molybdenum	0.00071	0.00269
Nickel	0.00226	0.00855
Magnesium	0.0114	0.04314
Mercury	0.00052	0.00197
Selenium	0.00085	0.00322
Tin	0.00551	0.02085
Titanium	0.0088	0.03330
Vanadium	0.00226	0.00855
Silicon	0.264	0.99893
Silver	0.00273	0.01033
Zinc	0.0106	0.04011
Sulfur	3.58	13.54615
Tantalum	0.00636	0.02407
Potassium	0.0895	0.33865
Wolfram	0.00542	0.02051
Ammonium	2.95	11.16233
K+	0.161	0.60920
Organic Carbon	4.69	17.74621
Total Nitrate	0.41	1.55137
Elemental Carbon	0.339	1.28272
Sulfate	13.7	51.83861
TOTAL	26.42818	100

VI.8.3 Elemental Composition—Aldine-25 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Arsenic	0.00151	0.01502
Barium	0.0226	0.22475
Bromine	0.00184	0.01830
Cadmium	0.0032	0.03182
Copper	0.0112	0.11138
Cerium	0.00014	0.00139
Iron	0.0638	0.63448
Lead	0.00758	0.07538
Indium	0.00057	0.00567
Manganese	0.00466	0.04634
Nickel	0.00123	0.01223
Magnesium	5.00E-05	0.00050
Lanthanum	0.0186	0.18497
Tin	0.00739	0.07349
Titanium	0.00151	0.01502
Vanadium	0.00132	0.01313
Silicon	0.057	0.56686
Silver	0.00184	0.01830
Zinc	0.0109	0.10840
Sulfur	0.913	9.07966
Potassium	0.0222	0.22078
Sodium	0.045	0.44752
Ammonium	0.419	4.16690
K+	0.0633	0.62951
Organic Carbon	3.77	37.49214
Total Nitrate	0.416	4.13706
Elemental Carbon	0.72	7.16030
Sulfate	3.47	34.50868
TOTAL	10.05544	100

VI.8.4 Elemental Composition—Galveston-20 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Antimony	0.00414	0.02805
Arsenic	0.00019	0.00129
Aluminum	0.0199	0.13483
Barium	0.0273	0.18497
Bromine	0.00203	0.01375
Cadmium	0.00174	0.01179
Copper	0.00047	0.00318
Cerium	0.00753	0.05102
Cesium	0.0057	0.03862
Gallium	0.00198	0.01342
Iron	0.0432	0.29269
Lead	0.00217	0.01470
Indium	0.00057	0.00386
Manganese	0.00137	0.00928
Iridium	0.00235	0.01592
Molybdenum	0.00184	0.01247
Nickel	0.00099	0.00671
Mercury	0.00043	0.00291
Lanthanum	0.00099	0.00671
Niobium	0.00108	0.00732
Selenium	0.0009	0.00610
Tin	0.00843	0.05712
Titanium	0.00311	0.02107
Scandium	0.00019	0.00129
Vanadium	0.00278	0.01884
Silicon	0.144	0.97564
Zinc	0.00174	0.01179
Strontium	0.00014	0.00095
Sulfur	2.45	16.59946
Tantalum	0.0136	0.09214
Potassium	0.0473	0.32047
Yttrium	0.00085	0.00576
Sodium	0.0988	0.66940
Wolfram	0.00461	0.03123
Ammonium	1.75	11.85675
K+	0.0731	0.49527
Organic Carbon	1.67	11.31473
Total Nitrate	0.214	1.44991
Elemental Carbon	0.19	1.28730
Sulfate	7.96	53.93129
TOTAL	14.75952	100

VI.8.5 Elemental Composition—Galveston-22 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Antimony	0.00014	0.00087
Aluminum	0.00085	0.00530
Barium	0.0273	0.17026
Bromine	0.00391	0.02438
Copper	0.00057	0.00355
Cerium	0.0056	0.03492
Cesium	0.00292	0.01821
Iron	0.0395	0.24634
Lead	0.0032	0.01996
Indium	0.0001	0.00062
Manganese	0.00028	0.00175
Molybdenum	0.00104	0.00649
Nickel	0.00066	0.00412
Gold	0.00085	0.00530
Lanthanum	0.0233	0.14531
Selenium	0.00099	0.00617
Tin	0.0104	0.06486
Titanium	0.00443	0.02763
Vanadium	0.00287	0.01790
Silicon	0.126	0.78580
Zinc	0.00141	0.00879
Sulfur	2.74	17.08809
Potassium	0.0685	0.42720
Sodium	0.0834	0.52013
Wolfram	0.00344	0.02145
Ammonium	1.74	10.85156
K+	0.0829	0.51701
Organic Carbon	2.54	15.84078
Total Nitrate	0.268	1.67139
Elemental Carbon	0.202	1.25978
Sulfate	8.05	50.20406
TOTAL	16.03456	100

VI.8.6 Elemental Composition—Conroe-30 August

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Aluminum	0.00898	0.10768
Barium	0.0268	0.32136
Bromine	0.00329	0.03945
Cadmium	0.00211	0.02530
Calcium	0.0447	0.53600
Copper	0.00038	0.00456
Iron	0.0479	0.57437
Lead	0.00381	0.04569
Indium	0.00325	0.03897
Manganese	0.00155	0.01859
Nickel	0.00019	0.00228
Gold	0.00155	0.01859
Lanthanum	0.00019	0.00228
Tin	0.0047	0.05636
Titanium	0.00447	0.05360
Vanadium	0.00061	0.00731
Silicon	0.106	1.27104
Silver	0.00132	0.01583
Zinc	0.00301	0.03609
Strontium	0.00122	0.01463
Sulfur	1.26	15.10864
Rubidium	0.00132	0.01583
Potassium	0.049	0.58756
Yttrium	0.00075	0.00899
Sodium	0.1	1.19910
Ammonium	0.352	4.22083
K+	0.0625	0.74944
Organic Carbon	2.88	34.53403
Total Nitrate	0.286	3.42942
Elemental Carbon	0.182	2.18236
Sulfate	2.9	34.77385
TOTAL	8.3396	100

VI.8.7 Elemental Composition—HRM-3-5 September

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Arsenic	0.00127	0.00509
Aluminum	0.0464	0.18582
Barium	0.0543	0.21746
Bromine	0.00575	0.02303
Copper	0.00207	0.00829
Chlorine	0.00099	0.00396
Cesium	0.0102	0.04085
Gallium	0.0009	0.00360
iron	0.146	0.58470
Lead	0.00339	0.01358
Indium	0.00508	0.02034
Manganese	0.00528	0.02115
Nickel	0.00146	0.00585
Magnesium	0.0232	0.09291
Mercury	0.00179	0.00717
Lanthanum	0.0204	0.08170
Tin	0.00843	0.03376
Titanium	0.00428	0.01714
Vanadium	0.00184	0.00737
Silicon	0.272	1.08931
Zinc	0.0266	0.10653
Strontium	0.00085	0.00340
Sulfur	2.35	9.41130
Tantalum	0.0109	0.04365
Potassium	0.163	0.65278
Yttrium	0.00099	0.00396
Sodium	0.206	0.82499
Zirconium	0.0016	0.00641
Ammonium	2.44	9.77174
K+	0.148	0.59271
Organic Carbon	9.26	37.08455
Total Nitrate	0.267	1.06928
Elemental Carbon	1.22	4.88587
Sulfate	8.26	33.07974
TOTAL	24.96997	100

VI.8.8 Elemental Composition—HRM-3-6 September

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Arsenic	0.00038	0.00102
Barium	0.0333	0.08936
Bromine	0.0049	0.01315
Copper	0.00123	0.00330
Cesium	0.00344	0.00923
Gallium	0.00179	0.00480
Iron	0.0483	0.12961
Lead	0.00245	0.00657
Manganese	0.00085	0.00228
Iridium	0.00325	0.00872
Nickel	0.00179	0.00480
Magnesium	0.00386	0.01036
Niobium	0.00085	0.00228
Selenium	0.00127	0.00341
Tin	0.00866	0.02324
Titanium	0.00377	0.01012
Vanadium	0.00353	0.00947
Silicon	0.123	0.33005
Silver	0.00019	0.00051
Zinc	0.0126	0.03381
Sulfur	4.06	10.89442
Tantalum	0.0148	0.03971
Potassium	0.157	0.42129
Sodium	0.126	0.33810
Wolfram	0.00758	0.02034
Ammonium	5.19	13.92661
K+	0.135	0.36225
Organic Carbon	12	32.20025
Total Nitrate	0.285	0.76476
Elemental Carbon	0.832	2.23255
Sulfate	14.2	38.10363
TOTAL	37.26679	100

VI.8.9 Elemental Composition—HRM-3-7 September

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Aluminum	0.00043	0.00320
Barium	0.0186	0.13858
Bromine	0.00301	0.02243
Copper	0.00254	0.01892
Cerium	0.00904	0.06735
Gallium	0.00179	0.01334
Iron	0.0288	0.21457
Hafnium	0.00428	0.03189
Lead	0.00405	0.03017
Manganese	0.0016	0.01192
Iridium	0.00268	0.01997
Nickel	0.0009	0.00671
Lanthanum	0.0178	0.13262
Niobium	0.00207	0.01542
Selenium	0.0016	0.01192
Tin	0.00386	0.02876
Titanium	0.00137	0.01021
Vanadium	0.00221	0.01647
Silicon	0.0527	0.39263
Silver	0.00217	0.01617
Zinc	0.00395	0.02943
Sulfur	1.38	10.28140
Tantalum	0.0125	0.09313
Rubidium	5.00E-05	0.00037
Potassium	0.0835	0.62210
Sodium	0.0927	0.69064
Ammonium	0.941	7.01072
K+	0.0821	0.61167
Organic Carbon	6.1	45.44676
Total Nitrate	0.279	2.07863
Elemental Carbon	0.476	3.54634
Sulfate	3.81	28.38560
TOTAL	13.4223	100

VI.8.10 Elemental Composition—HRM-3-8 September

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Antimony	0.00263	0.02210
Aluminum	0.00047	0.00395
Barium	0.0262	0.22015
Bromine	0.00164	0.01378
Copper	0.0008	0.00672
Cerium	0.0128	0.10756
Cesium	0.00164	0.01378
Gallium	0.00023	0.00193
Iron	0.0292	0.24536
Lead	0.00258	0.02168
Manganese	0.00206	0.01731
Nickel	0.0001	0.00084
Lanthanum	0.00942	0.07915
Tin	0.0113	0.09495
Titanium	0.00249	0.02092
Scandium	0.00019	0.00160
Vanadium	0.00089	0.00748
Silicon	0.0466	0.39157
Zinc	0.00497	0.04176
Sulfur	1.36	11.42773
Tantalum	0.00694	0.05832
Rubidium	0.00019	0.00160
Potassium	0.0369	0.31006
Sodium	0.0884	0.74280
Wolfram	0.00624	0.05243
Ammonium	1.02	8.57079
Organic Carbon	3.89	32.68666
Total Nitrate	0.268	2.25193
Elemental Carbon	0.278	2.33596
Sulfate	4.79	40.24912
TOTAL	11.90088	100

VI.8.11 Elemental Composition—HRM-3-13 September

	PM 2.5 (ug/m^3)	% OF TOTAL
CONSTITUENT		
Arsenic	0.00145	0.01580
Barium	0.026	0.28324
Bromine	0.00042	0.00458
Copper	0.00098	0.01068
Chlorine	0.00352	0.03835
Cerium	0.0233	0.25383
Gallium	0.00141	0.01536
Iron	0.0546	0.59481
Hafnium	0.00478	0.05207
Lead	0.00244	0.02658
Indium	0.00071	0.00773
Manganese	0.00432	0.04706
Iridium	0.00117	0.01275
Nickel	0.00333	0.03628
Magnesium	0.00164	0.01787
Mercury	0.00094	0.01024
Lanthanum	0.00567	0.06177
Niobium	0.00066	0.00719
Selenium	0.00042	0.00458
Tin	0.00839	0.09140
Titanium	0.00281	0.03061
Vanadium	0.00933	0.10164
Silicon	0.0651	0.70920
Zinc	0.0083	0.09042
Strontium	0.0001	0.00109
Sulfur	0.804	8.75875
Tantalum	0.0121	0.13182
Potassium	0.0175	0.19064
Sodium	0.166	1.80840
Ammonium	0.582	6.34029
Organic Carbon	2.88	31.37463
Total Nitrate	0.283	3.08299
Elemental Carbon	0.723	7.87634
Sulfate	3.48	37.91102
TOTAL	9.17939	100

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